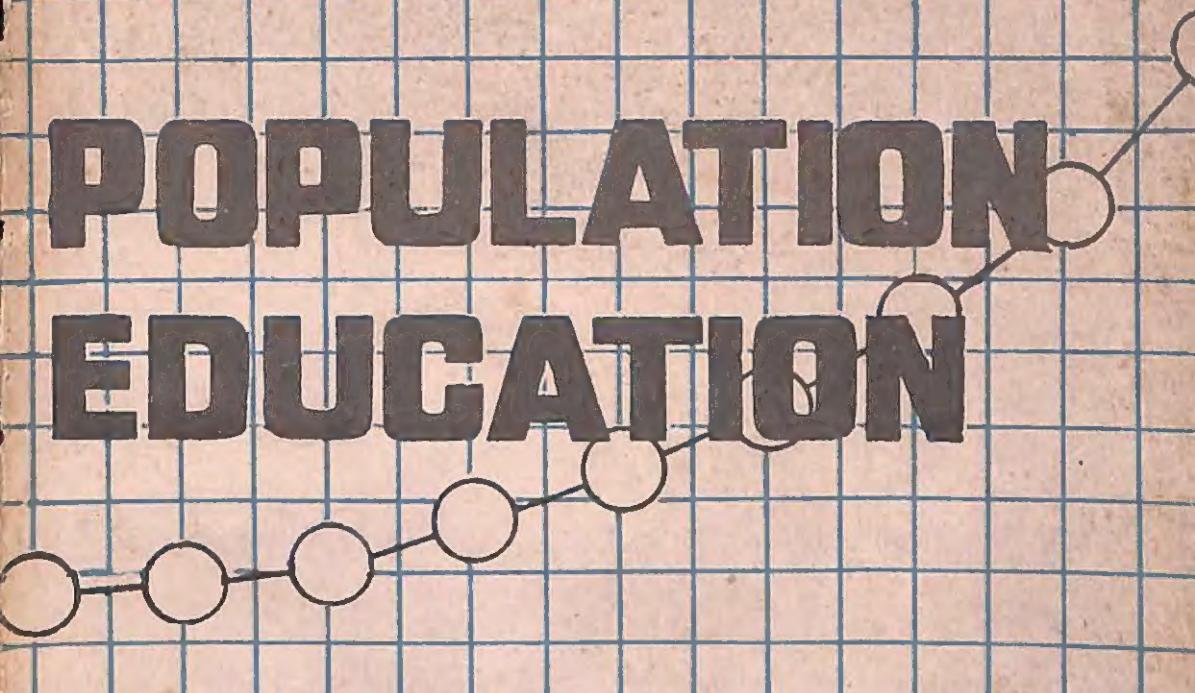


POPULATION EDUCATION



SELECTED READINGS

POPULATION EDUCATION

—Selected Readings

Editors

T. S. MEHTA
RAMESH CHANDRA



राष्ट्रीय शैक्षिक अनुसंधान और प्रशिक्षण परिषद्

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FOREWORD

There is a general feeling in the world that children at all stages of school education should be exposed to problems arising out of the rapid growth in population. The manner in which this is to be done has engaged the attention of investigators during the last decade. At the National Institute of Education, a significant amount of work has been done in the area of population education with special reference to India. Some curriculum for the school level and for the training of teachers has been developed. Symposia and seminars have been organised. In addition, useful material has been collected and published. In this connection, mention may be made of Readings in Population Education published by the Council in 1969. The present book is a second volume of Readings in Population Education. It contains valuable and useful material.

The Council is grateful to the authors and sources from where the materials printed here have been drawn, to M/s T.S. Mehta and Ramesh Chandra for the valuable work of compilation that they have done.

This collection of Readings is likely to prove useful to a wide variety of readers including teachers and teacher educators. The Council looks forward to comments and suggestions from readers. Such comments and suggestions can prove most helpful if a second edition is to be brought out.

S. V. C. AIYA

Director

National Council of Educational Research
and Training, Sri Aurobindo Marg,

November 21, 1972

New Delhi-16

PREFACE

One of the important function of the Population Education Cell of the NCERT is to produce relevant literature on Population Education for the benefit of those engaged in this programme. The types of things that are being undertaken under this programme include the development of curricula, handbooks for teachers, guides for teacher-educators and materials useful for educational planners in this area. For covering the last area mentioned above a series of "Readings in Population Education" are envisaged. The first volume of Readings was published in 1969. Since then some very thoughtful articles and papers have been written by some eminent persons in this area which could be of immense help to the workers. A few of these selected articles have been compiled in this second volume of the 'Readings'. It is in no way comprehensive.

It is a very heartening fact that several countries in the South East Asian Region have recently launched Population Education programmes. I am sure, they will find this volume useful in planning for the various aspects of a comprehensive programme.

We are extremely grateful to Dr. John Edlefsen, Prof. J.E. Jayasuriya, Dr. Pravin Visaria, Mr. Stephen Viederman, Prof. S.R. Wayland, Smt. Avabai B. Wadia, Mr. S. K. Nettananda, Mrs. Malini Balasingam, Dr. D. Gopal Rao and Mr. V.S. Mathur, who have written or given the permission to reproduce their articles in this volume.

T.S. MEHTA
Incharge Head

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in any one subject with these population awareness units. On the

EXPLOSION IN POPULATION

WORLD

POPULATION, ECONOMIC DEVELOPMENT AND THE WORLD ECOSYSTEM*

The population explosion is of mammoth dimensions, but it is not the only mammoth problem. It must be set in the context of efforts to bring a decent level of living to the world's poor, and to avoid exhausting the world's resources and polluting the earth's ecosystem in the process.

Besides exporting the medical and public health revolution to the rest of the world, the Western industrialized nations have also tried, since World War II, to spread the technology of industrialization and economic development. In general, the effort has not been very successful. Although the economies of the poorer nations, as measured by per capita income, have advanced, they have not been going up nearly as fast as those of the developed countries. The income gap has been widening, not narrowing.

Contributing to the widening of the gap is the fact that population is growing fast in the poor, non-industrialized countries and not as fast in the industrialized countries. The rich are getting richer and the poor are getting, not only poorer, but more numerous. Figures 1 and 2 dramatically show this growing income gap.

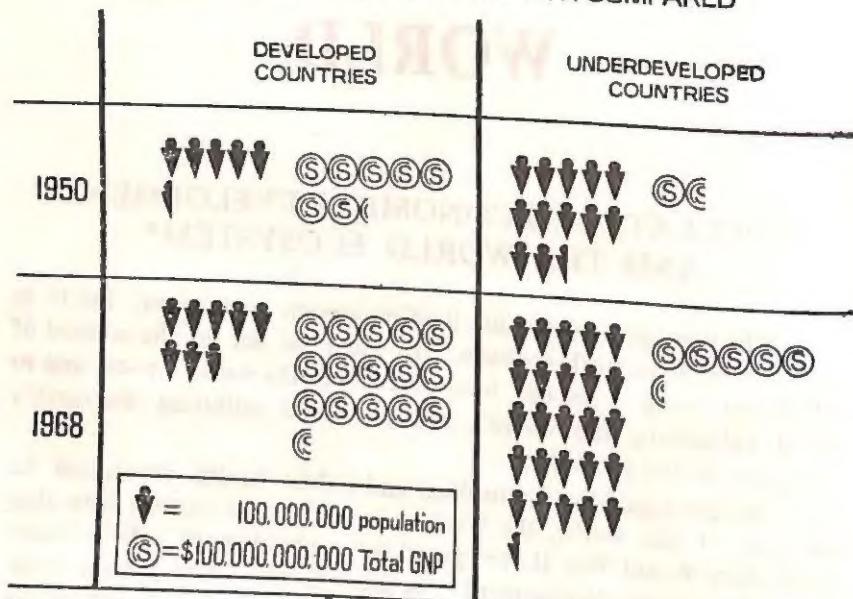
In this way the population explosion is accentuating and aggravating one of the most explosive questions in the world's near future: How long can the industrialized nations continue to exist as islands of growing affluence in a sea of rising poverty? It is also making more critical the question that only recently has been asked seriously: How long can the world's ecosystem continue to support and feed growing numbers of consumers of irreplaceable natural resources and polluters of the world's water, air and natural environment?

If the non-industrialized nations are to avoid future catastrophe on a massive scale, they have no other option but to devote their

*Paper distributed at the National Seminar on Population Awareness Education, Colombo, Ceylon—March 24-27, 197.

Figure No. 1

INCOME AND POPULATION GROWTH COMPARED



Source : United Nations, *Yearbook of National Account Statistics, Vol. II. International Tables, 1969.* New York : United Nations, 1970.

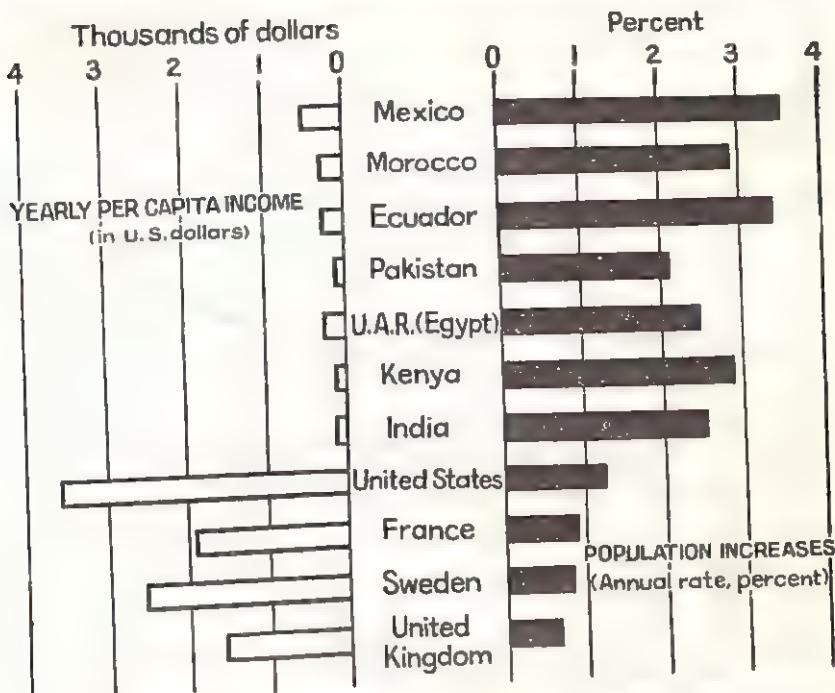
As population in developing countries has boomed, income has not risen as much as in industrialized countries ; the income gap has grown.

efforts on an unprecedented scale to (1) increasing their capacity to feed and adequately nourish their own citizens, (2) bringing the birth rate down sharply, and (3) increasing their non-agricultural output through savings, investment and creative ingenuity. The creative ingenuity may be the most important component of all. Help from the industrialized world may buy additional time and defer or ameliorate crises, but such voluntary aid cannot offer adequate or permanent solutions.

Improving the quantity and quality of food per person for the underdeveloped world is an uphill struggle, in major degree because of the fast rates of population growth. With population growing at a rate of 2.5 percent per year in the typical agrarian nation; with quantitative intake at sub-marginal levels so that the bodies and minds of young children are not having adequate opportunity for healthy development, adequate nutrition is of highest priority. Some progress is being made. Yields per acre of grain crops have increased

Figure No. 2

PER CAPITA INCOME AND POPULATION GROWTH, SELECTED COUNTRIES



Sources : United Nations, *United Nations Statistical Yearbook*. New York : United Nations, 1970. United Nations, *United Nations Demographic Yearbook*. New York : United Nations, 1970. Population Reference Bureau, Inc. 1970 *World Population Data Sheet*, April 1970.

Countries with low per capita income have high population growth.

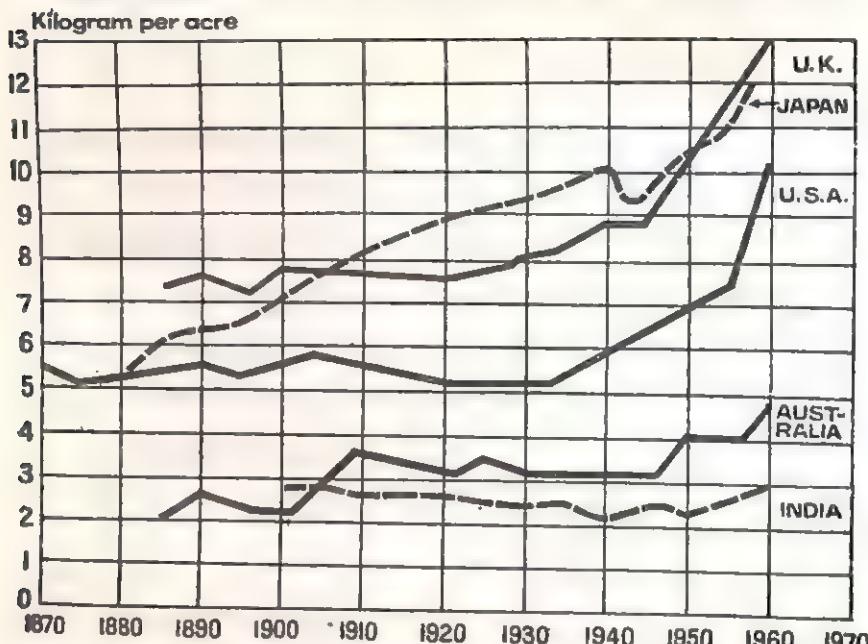
rapidly in the last century, as shown in Figure 3. Even more encouraging has been the dramatic improvement in the yield of new strains of wheat and rice that are particularly well suited to the climate of countries like Mexico, Pakistan and India. Dr. Norman Borlaug received the Nobel prize for peace in 1970 for his work in developing those new strains.

But Figure 4 shows the worldwide situation and the tremendous distance yet to go. The upward trend in agricultural production may, for a time, keep up with the 2.5 percent rate of population growth, but it cannot keep this growth rate up for a very long period.

Population growth not only creates pressure on agriculture; it also increases the difficulty in finding jobs for the growing numbers in

Figure No. 3

GRAIN YIELD PER ACRE, SELECTED COUNTRIES, 1870-1960



Source : Brown, Lester R. *Increasing World Food Output : Problems and Prospects*.
Foreign Agricultural Economic Report No. 25. Washington, D.C. :
 Government Printing Office, 1965.

Grain yields have increased in this century in some countries; new strains of wheat and rice promise similar gains for agrarian nations.

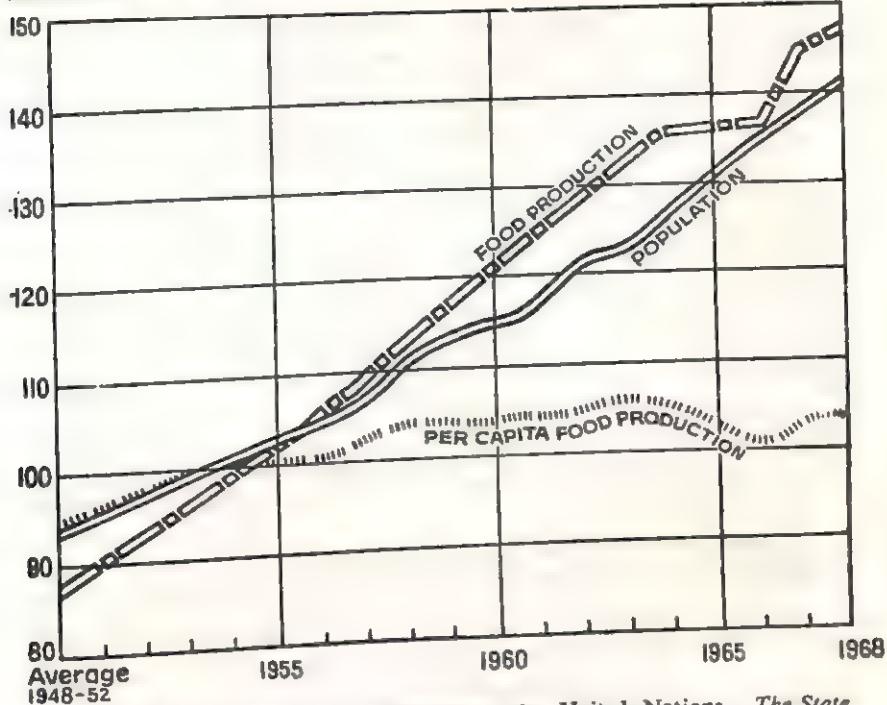
largely non-industrialized countries. Dr. William Thiesenhsen of the University of Wisconsin points out (*Science*, March 5, 1971, p. 868) that, "In Latin America, regardless of what happens to the birth rate in the future, the labor force will keep growing rapidly for a generation. In countries where unemployment is already a serious problem, such a prospect is chilling."

There are differences of opinion and of theory as to whether and how the poor nations can raise their incomes and lower their population growth rates sufficiently to bring their living standards up to levels comparable to the industrialized nations. On the one hand, there is great apprehension that population growth in the non-industrialized nations may be out of hand; the possibility may be remote that the developing world may achieve a demographic transition to low birth rates to match their low death rates in time to avert catast-

Figure No. 4

WORLD POPULATION AND FOOD PRODUCTION, 1948-1968

Index (1952-56 = 100)



Source : Food and Agriculture Organization of the United Nations. *The State of Food and Agriculture, 1969.* Rome : Food and Agriculture Organization, 1969.

World food production has barely kept pace with population growth.

trophic famines. In contrast, some people retain the hope and even the conviction that such a demographic transition may come about much more rapidly than present indications give us ground for believing. Without a rapid reduction in birth rates to or below replacement levels, most of the developing nations have little prospect of accelerating their painfully slow increase in per capita income.

Regardless of theory, however, reducing the birth rate in agrarian nations has so far proven, in practice, even more difficult than increasing the food supply. While many developing nations have instituted official family planning programs, most have not been in operation long enough to show much effect, and results from those that have are not encouraging. The countries having support

of family planning programme are given in table No. 1.

TABLE 1
SUPPORT OF FAMILY PLANNING IN
UNDERDEVELOPED AREAS

[Population figures given in millions]

	Government Support (population)	per cent	Little or No Government Support (population)	per cent	Total population
All Developing Countries	1964	79	514	21	2478
Africa	146	42	198	58	344
Latin America*	76	30	173	70	249
East Asia	789	98	15	2	804
Other Asia	953	88	128	12	1081

* excludes Argentina and Uruguay

Source : Nortman, Dorothy, "Population and Family Planning : A Factbook," *Reports on Population/Family Planning*, December 1969.

Almost two billion people-79 percent in developing areas live in countries where there is some government support of Family Planning.

Increasing non-agricultural output of the agrarian nations through savings, investment and ingenuity is likewise very slow in coming. Economists generally agree that it requires about \$3 per capita of investment annually to increase annual output by \$1 per capita in underdeveloped countries. This amount of saving and investment is hard for poor nations to achieve. As with individuals, however, rates of saving within national societies depend on more than income levels. They depend on the actual opportunities and the perceived advantages which come from savings and investment, and the willingness of the individuals or the nations to arrange their lives and their institutions to exchange short-term hardship for long-range advantage.

While the non-industrialized nations are faced with enormous problems of elemental living, the industrialized nations are preoccupied with keeping their economies growing at a steady clip, keeping their more slowly growing populations fully employed, controlling the pollution they are generating at a high rate, fulfilling the demand for more numerous and more expensive services and trying to keep their complex, interrelated societies from falling apart. In the process, they are consuming the earth's scarce fuels and mineral resources

at a prodigious rate with every expectation of continuing to increase their rates of consumption on a per capita basis and especially on an absolute basis. In this regard, resource consumption is analogous to population increase : It cannot continue to double at an accelerated rate.

To what extent population problems have aggravated the social and economic problems of the United States has been a matter of increasing interest and dispute. The issue is now being studied by the Commission on Population Growth and the American Future authorized by Congress in March 1970 and appointed by the President. In its interim report issued in March 1971, the Commission expressed its preliminary conclusion in these words : "Our view, at this stage of our inquiry, is that population growth of the magnitude we have had since World War II has aggravated many of the nation's problems and made their solution more difficult." The Commission's final report in March 1972 will be awaited with great interest.

What is also in dispute, but without comment by the Commission in its interim report, is the question as to the extent to which the increase in population of the United States (and other high consumption economies) may place a stress on the world environment. Some argue that the United States should spend whatever is necessary to control its pollution regardless of population growth, and that U.S. growth in the consumption of the natural resources of underdeveloped nations is actually beneficial to them because it provides them with needed foreign exchange with which to industrialize.

Others point out that population growth in affluent countries puts a disproportionately heavy load on the environment. One American, for example, consumes some 30 times as much oil and scarce minerals as one Pakistani. He is responsible for a very much higher level of pollution of the air and water of the earth. His consumption makes him more responsible for overfishing the seas, exterminating animal species, poisoning and killing inland lakes and other degradations. Some observers assert, therefore, that even a comparatively slow rate of population growth in the United States may have as deleterious a long-range effect on man's total environment as 10 or 20 or 30 times faster growth of an equivalent population in low consumption agrarian economies.*

* For detailed analysis of this interesting argument please see two recent articles "Man and his Environment" by Ansley J. Coale, *Science*, Oct. 9, 1970, p. 132 and "Impact of Population Growth" by Paul R. Ehrlich and John P. Holdren, *Science*, March 26, 1971, p. 1212.

INDIA

THE TEN YEAR COUNT*

An army of more than 1,250,000 enumerators went into action in a gigantic operation on the 10th of March, 1971 to collect data on the important demographic, social and economic characteristic of every individual in the country. This operation was not merely impressive in terms of sheer size but even in terms of quality and sophistication; the Indian Census operation ranks among the best in the world. This was the Eleventh decennial census which marked the centenary of census taking in the country.

The result of the nationwide count showed that the country's population at the crack of dawn on April 1, 1971, stood at 54,69,55,945. The population recorded in 1961 being 439,072,582, it indicates a net addition of 107,883,363 i.e. roughly 108 million or a growth rate of 24.57 per cent as compared to the growth rate of 21.5 per cent during the previous decade. The decade affords an interesting study in retrospect in regard to the growth of population in various facets of male and female ratio, statewise break-up and the growth of literacy in the country.

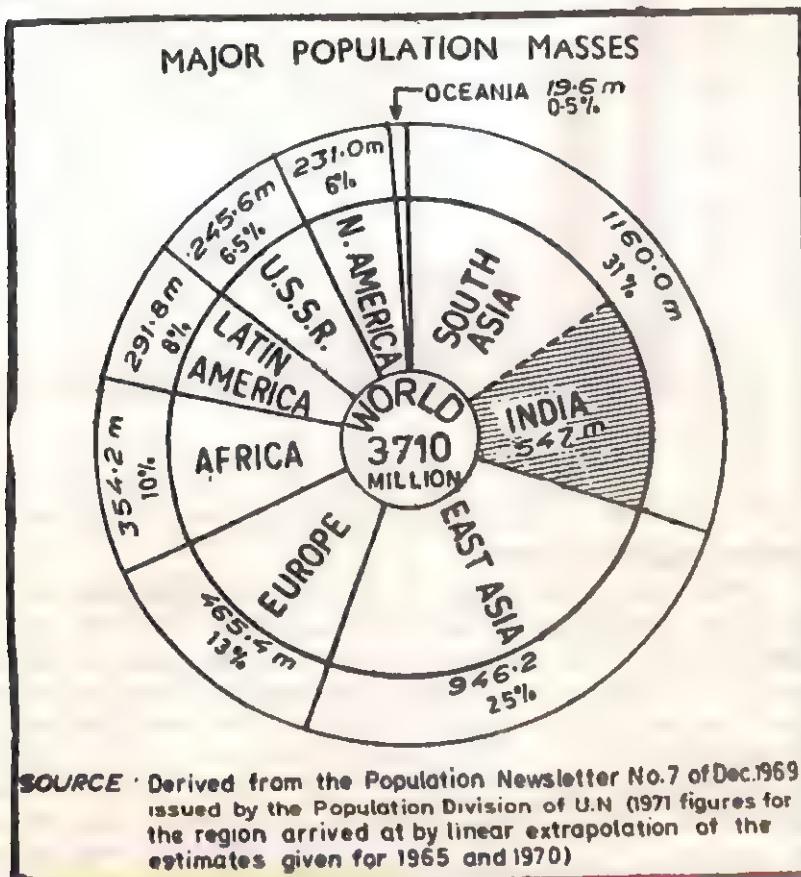
India's total population is made up of 283, 055, 987 males and 263, 899, 958 females. Thus the sex ratio stands at 932 females for 1,000 males. Of the total literacy which stood at 29.35 per cent, males shared 39.49 and females 18.47 per cent.

In the total world population of about 3,710 million, India occupies an outstanding place, constituting about a seventh or 15 per cent of the total figure. It is the seventh largest country in terms of area (3.27 million sq. km.) and the second most populous country in the world. In numbers it is next only to mainland China whose present estimated population rests at 750 million, and is followed by the USSR. (243 million), USA (203 million), Pakistan (114 million),

* Yojana, Vol. XV, No. 10 & 11, June 13, 1971.

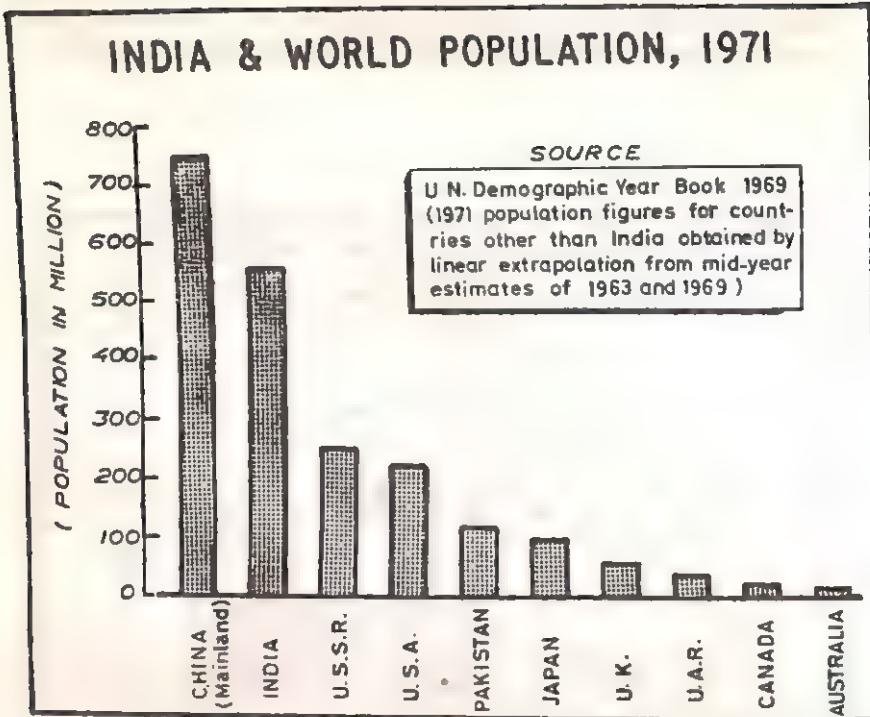
Japan (103 million), Canada (21 million) and Australia (12.5 million). It would be seen that India's population size is almost equal to that of the population of USA, USSR and Japan put together.

Figure No. 1



The world today is 3,710 million strong. Of this number 547 million, or nearly 15 per cent, are Indians. The world's seventh largest country in size, India is the second largest in terms of population, next only to China's 750 million.

Figure No. 2



Rankings Slightly Disturbed

The statewise break-up of the country's population reveals that the rise has been progressive in varying degrees in all the States and Union Territories, but their rankings have been slightly disturbed. It is interesting to note that some States and Union Territories have consistently maintained a higher growth rate than the all-India average both in 1961 and 1971, while others have recorded slightly depressed growth rate. Some States which had a lower rate than the all-India average in 1961 have witnessed a phenomenal increase. The reasons are not far to seek. Since the last census of 1961 there were a few changes in the boundaries of certain States and also some new States came into being. Erstwhile Punjab was trifurcated and the area was distributed between the attenuated State of Punjab and the new State of Haryana and Himachal Pradesh. Chandigarh was constituted into a separate Union Territory. Meghalaya was constituted as an autonomous State within Assam. Himachal Pradesh, which was a Union Territory attained the status of a full-fledged State. Nagaland which was a Union Territory in 1961, attained

statehood soon after 1961. Thus in 1971 there were 18 States as against 15 in 1961 and there were 11 Union Territories and others areas in 1971 as against 13 in 1961.

TABLE - I
POPULATION OF STATES
(1971 Census—Provisional figures)

	<i>Population in 1961 (and rank)</i>	<i>Population in 1971 (and rank)</i>	<i>Density of Population 1971 (per sq. km.)</i>
INDIA	439,072,582	546,955,945	182*
STATES			
1. Andhra Pradesh	35,983,447 (4)	43,394,951 (5)	157
2. Assam	11,127,939 (14)	14,857,314 (13)	149
3. Bihar	46,455,610 (2)	56,387,296 (2)	324
4. Gujarat	20,633,350 (9)	26,660,929 (9)	136
5. Haryana	7,590,543 (15)	9,971,165 (15)	225
6. Himachal Pradesh	2,812,463 (17)	3,424,332 (18)	62
7. Jammu & Kashmir	3,560,976 (16)	4,615,176 (16)	N.A.
8. Kerala	16,903,715 (12)	21,280,397 (12)	548
9. Madhya Pradesh	32,372,408 (7)	41,449,729 (6)	93
10. Maharashtra	39,553,718 (3)	50,295,081 (3)	163
11. Mysore	23,586,772 (8)	29,224,046 (8)	152
12. Nagaland	369,200 (23)	515,561 (23)	31
13. Orissa	17,548,846 (11)	21,934,827 (11)	141
14. Punjab	11,135,069 (13)	13,472,972 (14)	268
15. Rajasthan	20,155,602 (10)	25,724,142 (10)	75
16. Tamil Nadu	33,686,953 (6)	41,103,125 (7)	316
17. Uttar Pradesh	73,746,401 (1)	88,299,453 (1)	300
18. West Bengal	34,926,279 (5)	44,440,095 (4)	507
UNION TERRITORIES AND OTHER AREAS			
1. A. & N. Islands	63,548 (27)	115,090 (27)	14
2. Chandigarh	119,881 (26)	256,979 (26)	2254
3. Dadra & Nagar Haveli	57,963 (28)	74,165 (28)	151
4. Delhi	2,658,612 (18)	4,044,338 (17)	2723
5. Goa, Daman & Diu	626,667 (22)	857,180 (22)	225
6. L. M. & A. Islands	24,108 (29)	31,798 (29)	994
7. Manipur	780,037 (20)	1,069,555 (20)	48
8. Meghalaya	744,833 (21)	983,336 (21)	44
9. N.E.F.A.	336,558 (25)	444,744 (25)	N.A.
10. Pondicherry	369,079 (24)	471,347 (24)	982
11. Tripura	1,142,005 (19)	1,556,822 (19)	149

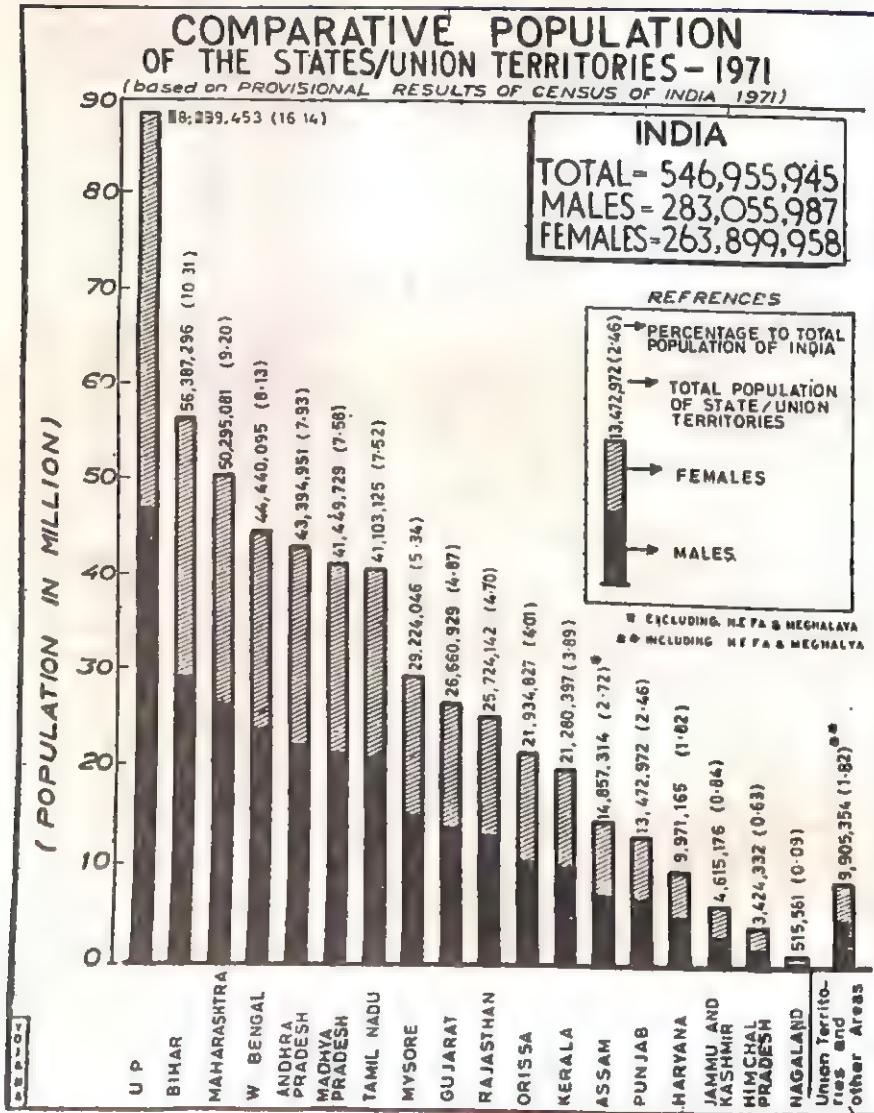
*Density worked out after excluding the population and area of N.E.F.A. and Jammu and Kashmir.

N.A. : Stands for Not Available.

Uttar Pradesh with a total population of 88.3 million commanded the largest share of the total population. Bihar with 56.4 million and Maharashtra with 50.3 million enjoyed the second and third places respectively. These three State have continuously maintained their status of the 1961 census. West Bengal with 44.4 million population, which had the fifth place in 1961, registered an increase

in status at the expense of Andhra Pradesh which has been relegated to the fifth position. Similarly Madhya Pradesh (41.5 million) which occupied the seventh rank in 1961, has gone up to the sixth place in 1971 at the cost of Tamil Nadu (41.1 million). The remaining States and Union territories in varying degrees have maintained their 1961 status except Assam which has registered an increase in population and gained the thirteenth position instead of the four-

Figure No. 3



teenth. Delhi too has moved up to the seventeenth position from the eighteenth held in 1961 and has also gained a lead over Himachal Pradesh (3.4 million).

The States and Union Territories that have shown an increased rate of growth above this all-India average are Goa, Daman and Diu whose rate of increased growth was more than 600%, that is, more than six times faster than the rate of growth in the previous decade; Jammu & Kashmir (214%), Nagaland (182%), Laccadive, Minicoy and Amindivi Islands (118%), Tamil Nadu (86%), Pondicherry (67%), Andhra Pradesh (32%), Orissa (26%), Meghalaya (26%), Uttra Pradesh (18%), Madhya Pradesh (16%) and Maharashtra (15%). The States and Union Territories that showed a marked fall in the growth rate during the decade 1961-71 as compared to the previous decade are Chandigarh (-71%), Tripura (-54%) and Dadra and Nagar Haveli (-29%). But it will be observed that the decadal growth rate in 1961-71 was quite considerable in all these units.

The 1971 census of India has belied the conjectures of phenomenal rise in population made by the Experts Committee. According to the Committee's projection, the population should have been 561 million. The shortfall of 14 million can be attributed to two major factors which were perhaps over-estimated by the demographers : the death rate and the impact of sustained campaign of family planning. The Experts Committee optimistically assumed that death rate which stood at 17.6 per 1,000 in 1963, would come down to 14 in 1968 and 11.3 by 1973. On the other hand, the sample registration data of the Registrar General's office indicated a prevailing death rate of 16.8 in 1968, shooting up to 19.3 in 1969. These two estimated rates, though not very consistent, would show that the death rate could not have dropped to the level assumed by the Projections Committee. According to the Census Commissioner the infant mortality rate drafted by the National Sample Survey for the period 1958-59 without making any adjustment for possible under-enumeration of vital events, might have led to an over-expectation of fall in mortality for the period 1961-70. Anyhow, the provisional census figures *prima facie* indicated that the impact of Family Planning Programme had been more progressively felt than what was anticipated.

Sex Ratio

The most significant features of census relates to the continuous preponderance of male population over females. The sex ratio, which stands at 932 females for every thousand males is not

the singular characteristic of this census only but this disparity in almost all age groups has been evident over several decades. Though the reason for this disparity has not been fully explained the census authorities have attributed it to the following factors : (i) preference for male children and the consequent neglect of female babies; (ii) the selective nature of certain types of mortality for females; and (iii) high maternal mortality.

The States where females out-number males per thousand are Kerala (1,019) and Dadra and Nagar Haveli (1,007). Orissa's sex ratio which was in favour of females till 1961 (1,001) has now changed in favour of males. There are now 989 females per 1,000 males. It may be observed that even in respect of Kerala where the sex ratio is still in favour of females it has been gradually coming down. It was 1,022 in 1961.

Due to sustained and unprecedented expansion of primary education and many literacy drives, the percentage of literacy has risen from 24.03 in 1961 to 29.35 in 1971. The females shared 18.47 per cent in 1971 as against 12.95 per cent in the last decennial year. The achievement in literacy is not staggering because a faster growth of population has pushed the country behind in its attempt to reach universal literacy.

It may be interesting to observe that Chandigarh, has now moved to the first position from that of second in 1961, presently being taken by Kerala. Delhi which topped the list in 1961, is now relegated to the third position, formerly held by Kerala. Creditably Goa has ascended to the fourth position from the seventh and the Union Territory of Laccadive, Minicoy and Amindivi Islands to the sixth from as low as fifteenth in 1961. While other States and Union Territories continue to maintain the low level Status Quo, Orissa has slipped down from the sixteenth rank in 1961 to the twentyfirst in 1971.

EXPANSION IN EDUCATION

REVIEW OF PROGRESS IN EDUCATION*

A suitably oriented system of education can facilitate and promote social change and contribute to economic growth, not only by training skilled manpower for specific tasks of development but, what is perhaps even more important, by creating the requisite attitudes and climate. Facilities for universal elementary education are a pre-requisite for equality of opportunity.

There has been expansion at all levels of education during the last eight years (Annexures I to IV). The enrolment in classes I-V increased from 35 million in 1960-61 to 55.5 million in 1968-69; in classes VI-VII from 6.7 million to 12.3 million; in classes IX-XI from 3 million to 6.6 million; and at the university stage (for arts, science and commerce faculties) from 0.74 million to 1.69 million. The admission capacity in engineering and technological institutions increased from 13,824 to 25,000 at the degree level and from 25,800 to 48,600 at the diploma level. Considerable thought has also been given to the reform of the education system. The recommendations of the Education Commission (1964-66) form the basis of the National Policy on Education and provide the framework for the formulation of the Plan programmes. Some efforts have been made in the States and at the Centre to enrich curricula and improve text-books and teaching methods. Steps have been taken to provide educational and vocational guidance, and develop facilities for science education and post-graduate education and research. The number of scholarships, stipends and free-ships have considerably increased, especially for the backward sections of the community. Salary scales and service conditions of teachers have been improved. Expenditure on education from all sources¹ is estimated to have increased from Rs. 344 crores in 1960-61 to Rs. 850 crores in 1968-69. During the same period, expenditure from Government sources increased from Rs. 234 crores, or 68 per cent of the total expenditure in 1960-61, to an estimated sum of Rs. 640 crores or 75 per cent in 1968-69.

* Abridged from *Fourth Five Year Plan (1969-74)*, New Delhi, Planning Commission, Government of India, 1970. (Chapter 16)

¹ Government and non-Government (Local bodies fees, endowments, etc.) on all types of educational institutions.

Elementary Education

The State-wise position of enrolment is indicated in Annexures II, III and V. Bihar, Madhya Pradesh, Rajasthan and Orissa have the problem of low enrolment of girls and of children of Scheduled Castes and Scheduled Tribes whose numbers in these States are quite sizeable. Efforts will be made to remove the imbalances within States in regard to the provision of educational facilities at the elementary stage. Some States are considering the adoption of double shift in classes I and II, which between them account for 60 per cent of the enrolment in classes I-V. It is proposed to make a study of the system as it has operated in Kerala so as to facilitate its introduction elsewhere.

In regard to the age-group 11-14, the problem is much more difficult as a large majority of the parents in rural areas withdraw their children from schools. The problem needs special attention in Bihar, Madhya Pradesh, Orissa, Rajasthan and Uttar Pradesh. A possible remedy is to provide part-time education on a large-scale to children of this age-group and provision has accordingly been made for pilot projects, which will facilitate large-scale development later on. Setting up of schools within the reach of every child is the first necessary step towards universality of enrolment. To achieve this at minimum cost, detailed district plans will be drawn up. Each State will formulate a phased programme for the introduction of universal education for all children in the age-group 6-14.

Secondary Education

In the Fourth Plan, it is expected to enrol 3.1 million additional pupils in classes IX-XI. The location of new schools will be determined according to the requirements of each area as spelt out in detailed district plans. The main effort in the Fourth Plan will be to enrich the content and improve the quality of secondary education. A few States have taken preliminary steps to adopt the new pattern of secondary education, recommended by the Education Commission, and propose to complete the change over during the Fourth Plan.

A major task in the field of post-elementary education is to provide a large variety of vocational courses for children who do not intend to continue their general education beyond the elementary stage. These courses have to be of varying durations, depending upon the trades and vocations proposed to be learnt. The industrial training institutes will meet a part of this demand. To

prepare students to take up employment after the secondary stage, a number of vocational courses are being provided after class X in industrial training institutes, polytechnics, schools for nursing, and agricultural schools. It will also be necessary to devise a number of additional courses in response to new demands. Provision is being made for pilot projects for the purpose.

Teacher Education

At the elementary stage, the number of teachers is estimated to have increased from about 1.09 million in 1960-61 to about 1.60 million in 1968-69. There has been correspondingly a steady expansion of teacher training facilities so that the number of elementary trained teachers during the period increased from about 0.71 million to about 1.24 million, raising the percentage of trained teachers from 65 to 77. Further, during the period 1966-69, owing to financial stringency, some of the States were unable to employ all the teachers who passed out of the training institutions. This has led to considerable unemployment among trained teachers in some States. Faced with this situation, a few States have closed down some of the training institutions. Also taking advantage of the larger availability of trained teachers, some States have raised the period of training to two years. At present, the problem of untrained teachers is confined largely to the States and Union Territories in the eastern region. The programme which need special attention are : improving the quality of teacher education, training of more women teachers and teachers from the tribal communities, training of mathematics and science teachers for the middle classes and in-service training. Wherever necessary, correspondence courses will be organised for untrained teachers now working in schools. The State Institutes of Education will co-operate in the implementation of these programmes.

At the secondary stage, the number of teachers in 1968-69 was estimated at 0.525 million of whom 0.381 million or 73% were trained. The training facilities available, at present, at this stage are considered adequate and can be easily expanded if the need arises. The correspondence courses organised by the Central Institute of Education, Delhi and the four Regional Colleges of Education are helping to speed up the training of untrained teachers. The main programme during the Fourth Plan will be to improve standards of teacher education at this level and to organise a large in-service education programme especially for mathematics and science teachers. Funds will be placed at the disposal of the

University Grants Commission to improve the physical facilities of the departments of education in universities and secondary training colleges and upgrade the professional competence of the teacher educators working in them. These programmes will be coordinated with those of the National Council of Educational Research and Training, State Institutes of Education and State Institute of Science Education.

ANNEXURE I

GROWTH OF ENROLMENT IN SCHOOLS AND COLLEGES :
1960-61 TO 1973-74

<i>Stage/Age-Group</i>	<i>Unit</i>	<i>Boys/Girls</i>	<i>1960-61</i>	<i>1965-66</i>	<i>1968-69</i>	<i>1973-74 (targets)</i>
1	2	3	4	5	6	7
Primary (6-11) Classes I-V	million	total	34.99 (62.4)	50.47 (76.7)	55.49 (77.3)	68.58 (85.3)
	million	boys	23.59 (82.6)	32.18 (96.3)	34.92 (95.2)	41.25 (99.6)
	million	girls	11.40 (41.4)	18.29 (56.5)	20.57 (58.5)	27.33 (70.1)
Middle (11-14) Classes VI-VIII	million	total	6.70 (22.5)	10.53 (30.9)	12.27 (32.3)	18.10 (41.3)
	million	boys	5.07 (33.2)	7.68 (44.2)	8.76 (45.4)	12.19 (54.3)
	million	girls	1.63 (11.3)	2.85 (17.0)	3.51 (18.8)	5.91 (27.7)
Secondary (14-17) Classes IX-XI ¹	million	total	3.03 (11.1)	5.28 (17.0)	6.58 (19.3)	9.69 (24.2)
	million	boys	2.47 (17.5)	4.08 (25.6)	4.95 (28.5)	7.00 (34.3)
	million	girls	0.56 (4.3)	1.20 (7.9)	1.63 (9.8)	2.69 (13.7)
University education (17-23) (arts, science and commerce)	million	total	0.74 (1.5)	1.24 (2.3)	1.69 (2.9)	2.66 (3.8)
Technical education (admission capacity)						
Diploma	number	total	25801	48048	48600 ²	48600
Degree	number	total	13824	24695	25000 ²	25000

¹ Includes enrolment in classes IX to XII in case of Uttar Pradesh which the State Government regard as part of school education.

² The actual admissions were 27255 and 17890 respectively for diploma and degree courses.

NOTE : Figures in parenthesis indicate percentage of enrolment to the population in the corresponding age-group.

ANNEXURE II
PROVISION OF SCHOOLING FACILITIES—CLASSES I-V

(Enrolment in Thousands)

<i>Sl. No.</i>	<i>State/Union Territory</i>	<i>1960-61</i>		<i>1965-66</i>		<i>1968-69</i>	
		<i>enrol- ment</i>	<i>percen- tage of the age group</i>	<i>enrol- ment</i>	<i>percen- tage of the age group</i>	<i>enrol- ment</i>	<i>percen- tage of the age group</i>
<i>0</i>	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>	<i>6</i>	<i>7</i>
<i>States</i>							
1. Andhra Pradesh	2976	68	3769	77	3839	72	
2. Assam	1126	68	1443	73	1566	71	
3. Bihar	3184	51	3961	54	4444	57	
4. Gujarat	2030	65	2665	82	2988	83	
5. Haryana	included under Punjab		804	67	855	63	
6. Jammu and Kashmir	210	47	297	63	331	66	
7. Kerala	2391	108	2869	116	3219	120	
8. Madhya Pradesh	2011	49	2849	56	3142	57	
9. Maharashtra	3949	77	5194	89	5876	91	
10. Mysore	2168	74	3136	90	3279	85	
11. Nagaland	43	83	58	109	67	117	
12. Orissa	1411	64	1749	70	1899	70	
13. Punjab	1440 ¹	51 ¹	1334	75	1362	69	
14. Rajasthan	1115	41	1618	50	2013	56	
15. Tamil Nadu	3333	85	4511	102	4927	105	
16. Uttar Pradesh	4093	45	9018	84	9935	84	
17. West Bengal	2902	65	3950	74	4367	73	
<i>Union Territories</i>							
18. Andaman and Nicobar Islands	4	64	8	90	10.7	103	
19. Chandigarh	included under Punjab		17.2	89	22.3	105	
20. Dadra and Nagar Haveli	n.a.	n.a.	5	56	6.6	67	
21. Delhi	286	83	399	93	447	87	
22. Goa, Daman and Diu	n.a.	n.a.	95	117	109.6	129	
23. Himachal Pradesh	84	51	358	86	378	82	
24. Laccadive, Minicoy and Aminidivi Islands	3	102	3.9	111	4.7	127	
25. Manipur	117	98	163	120	171	111	
26. N.E.F.A.	n.a.	n.a.	13.1	27	16.8	32	
27. Pondicherry	31	75	48	100	54	105	
28. Tripura	87	55	134	71	156	73	
29. Total	34994	62	50469	77	55486	77	

¹ Includes Haryana and Chandigarh.

Source : Ministry of Education for the years 1960-61 and 1965-66 and State Governments/Union Territories for the year 1968-69.

ANNEXURE III

PROVISION OF SCHOOLING FACILITIES—CLASSES VI-VIII

(Enrolment in Thousands)

Sl. No.	State/Union Territory	1960-61		1965-66		1968-69	
		enrol- ment	percen- tage of the age group	enrol- ment	percen- tage of the age group	enrol- ment	percen- tage of the age group
0	1	2	3	4	5	6	7
<i>States</i>							
1.	Andhra Pradesh	408	17	651	25	526 ¹	27 ¹
2.	Assam	220	26	327	32	360	32
3.	Bihar	535	17	716	19	821	20
4.	Gujarat	387	29	597	35	727	40
5.	Haryana included under Punjab			206	32	308	46
6.	Jammu and Kashmir	59	25	87	34	117	45
7.	Kerala	695	58	865	65	984	69
8.	Madhya Pradesh	317	16	564	22	712	24
9.	Maharashtra	748	28	1223	39	1327	46
10.	Mysore	363	23	578	33	647	32
11.	Nagaland	7	25	12.2	43	17.2	56
12.	Orissa	108	9	251	19	305	21
13.	Punjab	439	29 ²	326	34	427	44
14.	Rajasthan	207	15	330	20	425	23
15.	Tamil Nadu	691	32	1066	46	1273	49
16.	Uttar Pradesh	824	17	1514	27	1659	27
17.	West Bengal	518	22	854	32	990	32
<i>Union Territories</i>							
18.	Andaman and Nicobar Islands	0.5	14	1.5	35	2.2	43
19.	Chandigarh included under Punjab			7.5	74	01	95
20.	Dadra and Nagar Haveli	n.a.	n.a.	0.5	12	0.9	20
21.	Delhi	112	62	183	78	205	78
22.	Goa, Daman and Diu	n.a.	n.a.	18	41	30	65
23.	Himachal Pradesh	20	23	86	39	112	49
24.	Laccadive, Minicoy and Amindivi Islands	0.3	18	0.7	38	0.9	47
25.	Manipur	23	43	25	37	29	37
26.	N.E.F.A.	0.8	6	2.6	10	3	11
27.	Pondicherry	7	32	11	45	14	51
28.	Tripura	15	20	29	33	37.9	38
29.	Total	6705	23	10532	31	12270	32

¹ Enrolment in classes VI-VII only.² Includes Haryana and Chandigarh.

Source : Ministry of Education for the years 1960-61 and 1965-66 and State Governments/Union Territories for the year 1968-69.

ANNEXURE IV

PROVISION OF SCHOOLING FACILITIES—CLASSES IX-XI
(Enrolment in Thousands)

Sl. No.	State/Union Territory	1960-61		1965-66		1968-69	
		enrol- ment	percen- tage of the age group	enrol- ment	percen- tage of the age group	enrol- ment	percen- tage of the age group
0	1	2	3	4	5	6	7
<i>States</i>							
1. Andhra Pradesh		196	9	342	14	542 ¹	15 ¹
2. Assam		126	13	207	18	225	17
3. Bihar		328	12	450	13	502	13
4. Gujarat		171	15	311	20	416	25
5. Haryana	included under Punjab			85	14	111	17
6. Jammu and Kashmir		23	10	42	17	59	24
7. Kerala		179	16	369	30	412	31
8. Madhya Pradesh		140	8	270	12	331	13
9. Maharashtra		339	14	617	22	803	26
10. Mysore		169	11	288	18	263	15
11. Nagaland		2	8	5.2	15	7.7	21
12. Orissa		45	4	101	8	147	11
13. Punjab		170 ²	13	151	17	175	19
14. Rajasthan		77	6	139	9	183 ³	11
15. Tamil Nadu		268	13	551	25	690	30
16. Uttar Pradesh ⁴		501	8	795	12	930	13
17. West Bengal		218	10	377	15	535	20
<i>Union Territories</i>							
18. Andaman and Nicobar Islands		0.2	6	0.5	12	1	20
19. Chandigarh	included under Punjab			5.2	56	6.2	61
20. Dadra and Nagar Haveli		n.a.	n.a.	0.2	6	0.33	8
21. Delhi		52	31	99.5	45	132	52
22. Goa, Daman and Diu		n.a.	n.a.	9	22	15	36
23. Himachal Pradesh		5	7	33	16.6	45	20
24. Laccadive, Minicoy and Aminidivi Islands		n.a.	n.a.	0.23	14	0.34	19
25. Manipur		14	29	13.6	23	16.6	24
26. N.E.F.A.		0.3	n.a.	1.6	5	1.7	5
27. Pondicherry		3	13	6.6	29	8.3	34
28. Tripura		5	8	12.5	16	17.9	21
29. Total		3031	11	5282	17	6576	19

¹ Enrolment relates to classes VIII to XI.² Includes Haryana and Chandigarh.³ Includes Pre-University Class.⁴ Enrolment relates to classes IX to XII.

SELECTED READINGS



POPULATION EDUCATION

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The Problem

In recent years population growth has become one of the most crucial human problems. The number of people in the world is growing at a staggering rate. It took the entire period of our history as a planet until 1850 to attain a population of one billion. The second billion took an additional 75 years. In early sixties we were 3.5 billion. If the trend continues twice as many people will be living on earth in the year 2000 as they were in 1968. The world population will shoot up to 7 billion. Today every tick of the clock adds 2.2 people to the population. The rhythm would increase to 2.7 by 1980, to 3.3 by 1996 and 4.4 by 2000 if the same rate continues. The picture is not very rosy to conceive. If the crisis has not yet arrived it is just 'round the corner'.

The core of this crisis lies in Asia. "Since the countries of Asia contain well over half the rising totals—and are growing at an even more rapid pace than the world average—the core of the problem is here."¹

Indian Situation

In India there had been a phenomenal rise in population in the last few decades. The population is growing annually at a rapid rate of 2.5%. At this rate over 13 million people (approximately the present population of Australia) are added to our population annually. Eighty-nine member countries of the U.N. out of 130 have lesser population than the yearly increase in our population. Every seventh person in the world is an Indian today. In the Census that was conducted in March 1971, it is estimated that the population of India is about 550 million. At this rate of increase the country's population may reach the incredible figure of 1 billion before the end of this century.

One of the major causes of this rapid population growth has

1. Draft Report "Regional Workshop on Population and Family Education". Regional Office of Education in Asia, Bangkok, October, 1970.

been a sharp fall in the death rate though the birth rate has remained almost the same in the last few decades. Major communicable diseases like Cholera, Malaria and Smallpox have been nearly brought under control and measures to eradicate them are being put into effect. The widespread use of antibiotics, vaccination and other health measures have greatly reduced many infectious diseases. In fact mortality has fallen considerably in last fifty years. And in response to these relatively improved health conditions life expectancy has risen from 32 years in 1950 to 51 in 1958. The rise, therefore, has assumed alarming proportions. The following table reveals this story:

TABLE I
BIRTH RATE, DEATH RATE AND GROWTH RATE

Period	Birth Rate	Death Rate	Growth Rate
1921-30	46.4	36.3	1.01%
1931-40	45.2	31.2	1.42%
1941-50	39.9	27.4	1.25%
1951-60	41.7	22.8	1.89%
1961-70*	38.6	14.0	2.46%
1971-80*	28.7	9.2	1.95%

Source* : Estimates based on the Projections made by Expert Committee on Population set up by the Planning Commission in 1964 under the Registrar General, Government of India.

TABLE II
GROWTH OF POPULATION

Census Year	Population (in millions)
1921	251.3
1931	279.0
1941	318.7
1951	361.1
1961	439.2
1971	563.0 (Estimated)

Source : 'India' 1969—Government of India publication.

Dr. Visaria of Bombay University has attempted an estimate of population increase and the density per square mile. If the annual rate of growth remains constant at the average figure (estimated for 1961-70, i.e., 2.38 per cent), the following table gives his estimates:

TABLE III
THE FUTURE POPULATION OF INDIA AND DENSITY PER SQUARE MILE, CONSTANT GROWTH ESTIMATED

<i>Year</i>	<i>Population (in millions)</i>	<i>Density (Per Sq. Mile)</i>
1971	557	452
1981	707	574
1991	897	728
2001	1,138	923
2051	3,740	3,035
2101	12,295	9,975

Source : Paper read at the Conference on Population Education for Younger Generations, Manipal, February, 1971.

The figures are certainly fantastic and may not come true, but they certainly point out towards the necessity of treating this problem on an emergency level and start an all-out effort on several fronts. The implications of population pressures are becoming more and more emergent and colossal in magnitude. Some important ones are mentioned below, which are more pressingly experienced by our country:

1. Rapid population growth is a threat to economic development, specially with respect to per capita economic growth (income for the average person in a country). The greater the population the less there is to distribute to the people. In India the growth of economies is just being 'eaten up' by even more rapid growth of population.

India has registered remarkable progress in both the industrial and agricultural sectors during the last twenty three years of her political freedom. Although the availability of goods and services has increased three-fold over the last decade or so, their per capita consumption has not increased at all. Take any aspect of Indian life, economic, social, educational, the same story is repeated—the increased facilities simply do not keep pace with the needs of the growing population. The national income figures are a good index to this unhappy situation. "India's total national income increased from Rs. 0.86 billion in 1948-49 to Rs. 1.49 billion in 1966-67 or an increase of 73.25 per cent over a period of nearly two decades. But the per capita income increased during the same period from Rs. 248 to Rs. 297, a meagre 19.76 per cent. Not only is India's per capita income today amongst the lowest in the world, but the rate of increase over two decades of overall national development is re-

markably insignificant.”²

The main reason why the Indian economy continues to be an economy of shortages is the country's excessive population growth. Between mid-1947 when India gained her political freedom and 1969 she added nearly 200 million to her population. Like other under-developed countries, India bears testimony to the fact that the technology of health and hygiene can be more rapidly transmitted than the technology of productive and economic growth. This means that the population increases rapidly as a result of death control but the increase in the production of food and other necessities does not keep pace.

2. The second crucial problem which the country is facing is that of providing adequate food for more and more people. While the achievements of the green revolution have been spectacular for the welfare of the millions of Indians, it was still modest in terms of actual needs. We are still importing millions of tonnes of food grains from foreign countries to feed the teeming millions. The battle of improving the quality of food has hardly begun. According to the U.N. Expert Committee findings 2,200 calories per day is the minimum needed to maintain adequate health. In India the average is much lower about 1,900 calories. According to the F.A.O. estimates food production must be doubled by 1980 and even tripled by 2,000 to maintain the present sub-standard nutritional level. In spite of scientific and technological advancement (even projected) the task appears to be well nigh impossible. Dr. Norman Borlang, the Nobel Laureate speaking at Pant University Convocation on the 16th March, 1971, very rightly pointed out: “I believe it is far better for mankind to be struggling for abundance than with the old problem of famine. Therefore, the frightening power of human reproduction must be curbed.”³

3. Rapid population growth in the last half a century has also affected the structure of our population, for a growing population is usually a ‘young population’. Almost half of the population of the country today is less than 16 years of age whereas the median for most advanced countries is 30 to 35 years. A young population requires a particular kind of expenditure to support it, a proportionately large outlay is required for supporting the social services needed for it like education, health, and other facilities, etc.

2. S. Chandrasekhar: How India is Tackling Her Population Problem. *American Quarterly Review*, October, 1969.

3. Dr. Norman Borlang: Convocation Address delivered at the Pant Agricultural University, Pant Nagar, U.P., India, 16 March, 1971.

"The economy in developing countries is thus put to additional pressure by the growing numbers, new demands for more schools, more job opportunities, more health facilities, more transport facilities and housing and so on. Thus we see that it is not only economic standards that are affected by rapid growth of population but the quality of life as a whole."⁴ Water and air pollution, transportation congestion shortage of housing, over-crowded schools, unemployment, limited civic amenities are some of the problems that bother even the more affluent societies than ours. Recently there had been a tendency of flocking to cities. While this urbanization has resulted in the development of industries, swelling' numbers have created environmental problems. Social tensions have also increased considerably and so have slums with all their nefarious activities.

No doubt continuous research into the means of fertility control has yielded in developing several methods. We have every reason to hope that more and better research will yield a wider variety, possibly safer and more reliable methods of fertility control. But we live in what may be the waning days of the simplistic faith in science and technology and to hope that science would somehow solve our population problem before we become a human ant-hill is rather ill-founded. The words may sound a little queer but are based on indisputable logic of facts and events. On a thorough enquiry into the problem of population pressures, it is clear that it is not a problem that could be solved by scientists. The question is not whether births and deaths will be brought into balance but when and how and at what level. It is more a social problem with cultural, economic and political implications, which has to be tackled at human, individual level. The opportunity to decide the number and spacing of children is a basic human right. Hence it is the decision at the individual level which is going to make any difference and not all the scientific discoveries.

The problem therefore boils down to the question "How will people elect to make use of all the scientific discoveries and methods in the area of fertility control ? If coercion is the answer further scientific discoveries would not be needed. But not even the most authoritarian of societies can afford to contemplate such extreme action, to speak of that in a democracy like ours will be outright blasphemous.

4. Mehta, T.S., Population Education in School Curricula—Working Document for Bangkok UNESCO Seminar, October, 1970.

A way Out !

What then is the way out ? Due to the realization that this is where the problem is most immediate existing population programmes tend to be aimed at those already in the reproductive group. In this regard it would be worthwhile to remember Sloan Wayland's very emphatic remarks, "As countries around the world have been working to bring the population increase into a balance with the general effort at economic and social development one important lesson has been learnt. The lesson is that the dramatic success experienced in reducing death rates in a short period of time cannot be duplicated in action to decrease the birth rates." The whole business of family planning and reduction of birth rate is not "once for all" affair nor is it concerned with only the population currently capable of bearing children. Perhaps more vital problem is that of the young people who will constitute the adult population of the world in the next three decades. Over 45 per cent of our population is under 15 years of age. This group will strongly influence the demographic situation in our country in the next few decades. Therefore, even more important than the practice of family planning methods is the cultivation of a desire amongst the youngsters to adopt family planning as a way of life. If the future population behaviour resembles that of their own parents today's population problem will be regarded by comparison, as only a minor one. If on the other hand these young people become cognizant of the factors of their population situation and recognize that it warrants more rational behaviour on their part, some of the worst consequences may be avoided. It is this desire and the competence to make decisions on an ever more rational basis which is of vital importance for developing responsible parenthood. Perhaps the quintessence of 'Responsible Parenthood' is this capacity and the desire to take rational decisions in regard to one's own family-size. In other words 'responsible parenthood' and 'responsible fertility behaviour' are very close.

This can be achieved only when we catch them young and through proper education develop right attitudes amongst the vast population which has yet to enter fertility age-group and thus strengthen and enlarge the area of commitment towards checking population growth. It is here that population education becomes relevant as a motivational instrument that will prompt the younger generation with a desire to adopt small family norm. This desire should grow out of both the concern for 'over population' and 'quality of life'.

Thus population education is not only concerned with population awareness but also with developing attitudes and values so that both quality and quantity are taken care of.

What is Population Education ?

Population education in a broad way can be defined as "an educational programme which provides for a study of the population situation in family, community, nation and the world, with the purpose of developing in the students rational and responsible attitudes and behaviours towards that situation."⁵ The National Seminar on Population Education held at Bombay in August 1969 defined it in terms of objectives: "The objective of population education should be to enable the students to understand that family size is controllable, that population limitation can facilitate the development of a higher quality of life in the nation and that a small family size can contribute materially to the quality of living for the individual family. It should also enable the students to appreciate the fact that for preserving the health and welfare of the members of the family, to ensure the economic stability of the family and to assure good prospects for the younger generation, that the Indian families of today and tomorrow should be small and compact."⁶

Under this widespread umbrella many things can be included in population education but the selection of content, the emphasis and the methods of treatment will obviously vary from place to place, culture to culture and the stage of the development of a particular country. It is, therefore, necessary that there is no rigidity about the content or emphasis of population education. However, a few major areas are clearly identifiable which could form the core of population education with the specific objectives of helping the young eventually to make more rational decisions concerning their own behaviour on population matters. Given the realities of the situation today these decisions are expected to be for smaller families.

Components of Population Education

Three major elements, viz.: (i) Determinants of population growth, (ii) Demography (The population situation), and (iii) Consequences of population growth, form the core of any population education programme. To this may be added two more ele-

5. Regional Seminar on Population and Family Life Education--UNESCO, Bangkok, 1970.

6. National Seminar on Population Education, NCERT, 1969.

ments—(iv) Human reproduction, and (v) Family planning policies and programmes, to make it more comprehensive and gear it to the needs of the country. Both of these elements are usually regarded as the integral parts of what is termed as Sex Education.

As far as the first three elements of population education mentioned above are concerned there is a general agreement and their place in any programme of population awareness is undisputed, since the stated goal is to develop in the students the knowledge and attitudes upon which to base their own more rational population behaviour. The factors which motivate that behaviour, therefore, form the core. It would be worthwhile here to dilate a little bit on these three major elements.

Determinants of Population Growth—In order to understand the different facets of the population problem it is absolutely necessary that the determinants or causes of population growth are made clear. This is a rather difficult job because the factors that motivate people towards their population decision are so very complex and varied. Some of them are deeply rooted in tradition and culture of a place. Some others have their origin in economic conditions, while some others have their base in religious or superstitious beliefs. As we know, in many societies there exists a social norm favouring the bringing up of large families. Even in our own country the tradition is to give 'Ashirvad' to the newly weds to bear large families of sons and grandsons. To attempt to change such norms without trying to understand the roots of the factors may not be successful. Hence the importance of determinants'.

Consequences of Population Growth—The consequences of rapid population growth is perhaps the most pervasive element of practically all population education programme the world over. This factor is easily understood and is most appealing because it directly effects the individual as well as the nation. It is most easily discernible both at the micro and the macro levels. Consequences of rapid population growth on economic development, social development, employment opportunities, food, health, nutrition, housing, education, recreation, etc., thus become vital component of population education. Ecological consequences—pollution of the environment endangering balance in nature are equally important.

Demography.—Understanding of the static and dynamic description of population situation at the micro and the macro levels is the third major objective of population education. This serves

as the link between the determinants and consequences. In order to assess changes in fertility, mortality and migration behaviour and in order to predict their consequences, it is necessary to measure these changes. Students should be able to comprehend and employ certain basic demographic tools—census reports and other population data—in order to understand and analyse the trends, both past and present, so that they could have some idea of the future. For planning the knowledge of the present situation and the future trends is imperative.

Sex Education Component in Population Education—The above three elements are more or less universally accepted but the controversy arises when the question of imparting what is called, 'Sex Education' comes up. The reasons are not too far to seek. There is a considerable world-wide confusion between 'Population Education', and 'Sex Education'. Often, the term 'Sex Education' tends to arouse considerable opposition even prior to the understanding of its content, of which, of course, there is a great variety differing substantially from country to country, and even within a country itself. However, there is a considerable overlap and area of agreement. It would be worthwhile to spell out 'Sex Education' in terms of major content components to see its relevance to the objectives of population education. By and large the following are regarded as the major components of sex education:⁷

- human physiology and reproduction
- contraception
- social interactions associated with human sexuality.

No doubt in terms of the goals of population education classified in this paper earlier the goals of sex education (with emphasis on the last two elements, particularly in the west) differ substantially. However, there is an area of overlap. This area of common elements narrows down or broadens according to the situation prevailing in various places and the degree of acceptance of the components of sex education. In Indian context 'Human Reproduction' is one such area which has been included in the Biology courses much before the advent of sex education. Therefore within the existing and accepted framework of the school curricula, human physiology and reproduction can easily be incorporated in population education without arousing any controversy.

The usefulness of its inclusion is very obvious because the

7. Based on the Report of Regional Seminar on Population and Family Life Education, UNESCO, Bangkok, 1970.

awareness that the birth is not a matter of chance or divine gift is crucial to individual decision making. The knowledge of the whole phenomenon of human reproduction will help in dispelling many myths and superstitions. It is all a matter of presentation. Knowledge about the human reproductive system can be imparted to the child without destroying what the traditional moralists would call his or her innocence. It will help children to learn things about reproduction more accurately and scientifically than what they learn accidentally and often inaccurately.

Very often children ask questions about sex and voice their puzzlement and curiosity some time or the other. They continue to be fascinated by the subject. It is our answers and the way we put them play an important part in forming their future attitudes and basic opinions about sex. Frank and honest responses can help them develop a healthy outlook. Memories of taboos form our own up bringing make many of us feel awkward in handling the legitimate curiosity of the young, his candid queries can catch us off ground and leave us self-conscious and concerned about 'saying the wrong things'. Quite often children learn wrong things about human reproduction from wrong quarters which sometimes lead to undesirable complexes. Formal education, is therefore, necessary. That is why there is a definite place for imparting knowledge about human physiology and reproduction and the continuation of the species in population education. But due consideration to the manner in which this is to be included is the primary and secondary education. Much will depend on the way it is handled by the teachers.

As far as the two other major elements of sex education, viz., (i) contraception, and (ii) social interactions are concerned, the degree of their being controversial or non-controversial differs from country to country and society to society. In some western countries and in Japan they are even being emphasized in educational programmes but by and large it may be true for a majority of Asian countries that they are not in favour of including them in population education, in schools. Several national and international conferences have voiced their concern in unequivocal terms. For example the Asian Regional Workshop on 'Population and Family Education' held at Bangkok in September-October, 1970, affirmed clearly that "In some instances, the attempt to include such controversial topics in population education may, in effect, destroy the entire programme before it has a chance to prove itself-

it may be advisable to exclude—either temporarily or permanently—any topic that would endanger the programmes very acceptance and implementation."

The position to those above mentioned aspects of sex education are too well-known particularly in traditional societies. In some quarters people feel that the information about sex will place youngsters in moral danger and "will give rise to sexual experimentation resulting in unwarranted pregnancies of the unmarried and a spread of venereal diseases." Some others feel that "it will unduly disturb the young to expose them to sexual information at an age when they are not ready for it." Yet others though not against the content are afraid of the handling of the subject by unsuitable teachers. These reservations are not altogether unfounded though they are only partially true.

It would, therefore, be in the fitness of things to go slow as far as the two latter aspects of sex education are concerned. The steps warranted prior to the introduction of these elements are :

- (a) Studying the needs of the community—its cultural constraints, social norms.
- (b) Ensuring that the programme is in the hands of competent people and has the backing of competent professional opinion.
- (c) Instituting pilot projects and a process of evaluation before launching an extensive programme.

Summing Up

Population education is a new area and no model exists which could be adopted to suit the conditions prevailing in our country. We have to tread a new ground keeping in view our cultural background and present needs and future aspirations. The essence of the programme should be to give the learner an insight into the totality of issues connected with population—including the nature, causes, determinants, consequences of population growth, both at the micro and the macro levels; the nature and dynamics of the reproductive process and finally the possibilities of planning family size and population growth. Hopefully the acquisition of such an insight may develop understanding and attitudes that contribute positively to rational decision making, both at an individual level and as a member of the society when occasion for such decision making arises. To quote Stephen Viederman "The aims of education are to increase awareness and hopefully to help us

achieve wisdom in the conduct of our lives, both as individuals and collectively. These aims are shared by the new field to be called population awareness education—population education at the result of the knowledge and understanding achieved through their education make responsible decisions concerning their own reproductive behaviour. The key concept is responsible decision making which involves fore knowledge and understanding of the consequences of one's own actions. This is the beginning of wisdom and represents the moral and ethical purpose of population education.”⁸

8. Viederman Stephen, “Developing Education Programs for Population Awareness”. New York, The Population Council, 1970. Mimeo.

WHAT IS POPULATION EDUCATION ??*

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My first exposure to what can appropriately be called population education was when I was enrolled in 1937 as a university undergraduate in a course called "population problems". The principal concern in that course was not "overpopulation" but what would be America's future when confronted with a declining population. This concern was based on then current demographic data which showed that the crude birth rate in the United States had gone down to 18 per thousand and that the net reproduction rate was below replacement. Ten years later when I was a fledgling university professor and teaching my first course in population problems we were still drawing on those same data, which disclosed that if the demographic trends which prevailed in the last half of the 1930's continued, the population of the United States would indeed begin to level off and decline. However, vital statistics reports made available during the late 1940's showed that a marked change was taking place in the reproductive behavior of Americans. The birth rate which had been down to 18 before the war went up steadily during the post-war period until it reached a total of just under 28 per thousand and we were confronted with what has since been referred to as the post-war "baby boom"**. Our concern then logically shifted from what are the implications of a potentially declining population to what are the implications of a population that is rapidly increasing. This interest, however, was limited to a very few people, mostly demographers teaching in American universities, and there was little recognition that demographic trends are of vital concern to all segments of every society and that education programs must be developed to create an understanding of these trends and their implications.

Similarly most of the countries of the world experienced rapid

* Paper distributed at the National Seminar on Population Awareness Education, Colombo, Ceylon—March 24-27, 1972.

** The crude birth rate now (1972) in the United States is 17 per thousand, and indications are that it will continue to decline.

population growth after world war II but not as a result of an increase in the birth rate, as was the case in the United States and certain other western countries, but as a result of a commendable decline in the death rate. Death rates are continuing to come down as they should, while birth rates in the majority of the developing countries remain very high. It is now obvious to all people working in the field of population that the rising aspirations of the world's peoples can never be achieved unless population growth and economic development are brought into balance. Furthermore, this desired reduction in fertility will not be achieved by appealing only to the adult generation. The world's young people, who will become the parents of the next generation, must be made aware of the magnitude of the population problem and educated to recognise that a small family is not only proper but highly desirable and easily attainable.

Today's parents have a measure of responsibility in helping to achieve these behavioural and value changes and should receive guidance and encouragement from responsible governmental officials, preferably through adult and community education programs, but the prime responsibility lies with the school systems. By their very nature educational institutions are better equipped to guide and direct attitude formation, while instilling skills and competencies, than are other of man's institutions. The educational systems of an increasing number of nations have made progress in reorienting school curricula away from purely academic subjects and toward a new focus—the functional demands of adult life. But this new focus must be sharpened and carried further so that every young man and woman becomes an informed, articulate exponent of a rational population policy for his own country and for the world.

Students in the elementary classes, starting as early as 8 or 9 years of age, can be made to understand the pattern of population growth in their own countries, with particular attention given to birth and death rates and rates of population increase. Then as they progress through the grades, they can be given comparative information for neighbouring countries and a general understanding of world trends. Such factual information could be introduced readily through such existing subjects as geography, civics and history. Arithmetic problems could easily utilize population data. This exposure to population dynamics should also include data regarding food production, preservation and distribution. A word of caution : students should not be overwhelmed in any one year or in any one subject with these population awareness units. On the

contrary, this new information should be introduced little by little so as to keep the student's appetite keen for more knowledge regarding population. Thus by the time each boy and girl is ready to graduate from secondary school each will have an appreciation of his and her roles and responsibilities as consumers and as potential producers in a complex society.

In addition to the instillation of this knowledge and related values, emphasis needs to be given to the economic and social consequences for a family made up of several children. Students must be made to understand that with a given level of resources and earning power, the larger the family, the smaller the share per child. This has long been true for town and city families but is becoming increasingly true for the majority of rural families, particularly in developing countries, where small holdings become ever smaller generation after generation. With this awareness each student can be taught to apply a similar analysis to his community, his nation and to the world as a whole. Each can then be made to realize what Dr. Hauser so aptly pointed out, that two kinds of global crises confront mankind, each posing major world politico-economic problems.

The first is the ultimate crisis which will result from the fact that the globe is finite and that living space will be exhausted unless population growth is checked. At this point students need to be disabused of the assumption that migration to other planets can become a feasible alternative to fertility limitation. The nearest star is Alpha Centauri, 4.3 light years away from the earth. Even at an average speed of 7 million miles per hour, a rocket ship would take 350 years to reach the nearest planet outside our own solar system.

But this is a long range problem. In the short run (i.e. up to the year 2000) there is no problem of exhausting the space on this earth but there is abundant reason to be extremely pessimistic about the possibility of greatly increasing the average world level of living during the remainder of the present century. This produces the second global crisis. The total world product of goods and services in 1960 could have supported approximately 750 million persons at the North American level of living and about 1.75 billion at the European level. The actual world population in 1960 was fast approaching 3 billion, however, and is now almost a billion. Thus it is easy to demonstrate to students that the economic load will become an impossible one for the developing nations if their

rates of population increase follow the trends indicated in the United Nations projections.

To achieve this awareness and concern there has been emerging in the past few years a new area of emphasis in education which is now generally referred to as population education. Several people have attempted definitions of population education but a universally accepted definition has not yet found its way into the literature.

A few of those which have been attempted are these:

"Population education is defined as the process by which the student investigates and explores the nature and meaning of population processes, population characteristics, the causes of population change and the consequences of these processes, characteristics and changes for himself, his family, for society and for the world." (Viederman).

"Population education is defined as the teaching and learning of reliable knowledge about the ways of enquiring into the nature of human population and the natural and human consequences of population change". (Massialas).

"Population education seeks to bring about a realization of the individual, family, social and environmental effects of the explosive increase in human population, the rapid shifts in concentration and distribution of people, the implications of changing age and other demographic patterns, and the conceivable options that may be open to mankind to cope with the consequent problems. While it is not confined exclusively to a particular age group it is focused primarily on students who will become the principal child-bearers within one or two decades". (Population Reference Bureau).

It is obvious from these rather involved statements that it is not easy to reduce the content and objectives of such a broad area of learning into a concise definition. Population education is a relatively new concept and it seems more logical to me to explain it in terms of objectives rather than by a single definition. I made reference to general objectives above but it may be helpful to list specific objectives. One of the best such enumerations was compiled by Bhatia in 1969. His six primary objectives of population education are :

To achieve:

- 1) Basic understanding of population dynamics including the

growth rate and structure of population in the country in the context of world population.

- 2) Appreciation of the significance of the population characteristics for the present and future quality of life including economic development and the attainment of a high level of health, education, housing, diet and other amenities of life.
- 3) Realization that the size of the family can be easily planned for the benefit of individual families and that large families are not necessary in the present day.
- 4) Understanding of the health risks involved for the mother and the child.
- 5) Appreciation of the small family as a setting in which a high quality of life for each person is more likely to be attained.
- 6) Understanding of the Government's Family Planning Programme in relation to the country's needs.

A somewhat more detailed enumeration of specific objectives was prepared by Tjokrowirono (Indonesia) : (abridged by me).

- 1) To understand the basic principles of demography.
- 2) To learn about the causative factors of rapid [population growth].
- 3) To understand the impact of rapid population growth.
- 4) To understand the close relationship between the people's well-being and socio-economic development.
- 5) To understand the meaning and significance of environmental harmony.
- 6) To learn that family size can be controlled, as opposed to fatalism.
- 7) To understand the significance of the small family "norm" and its relation to the quality of living.
- 8) To understand the far reaching consequences of population density and rapid growth to one's self and one's environment.
- 9) To realize that human behaviour has a direct influence on the social structure and on social change.
- 10) To change attitudes and instil a sense of responsibility towards the welfare of the nation and the world.

If these objectives are attained students will have instilled in

them an awareness and understanding of one of the most striking phenomena of the modern world, namely, rapid population growth, its causes and implications. A carefully developed program will assist students to conceptualize the relevance of population for themselves and will assist them to make rational and responsible decisions about population matters. While students need to be made to understand that too rapid population growth is a problem for their country and for the world they need also to be taught that population growth is a phenomenon which is responsive to human direction.

I will not discuss curricula and content in this paper. I do wish to make it clear, however, that population education is *not* sex education and it is *not* family life education even though it may share some content with these fields. A population education programme should, of course, include some of the content now taught in biology history, civics, geography, sociology, economics, religion, etc., and should logically be co-ordinated with some of the materials presented in environmental studies. Thus, it should represent a synthesis of knowledge from several fields. If properly done, children now in school as well as those out-of-school will be taught to make free and rational decisions concerning their future which will conform to their aspirations and make possible the progressive, prosperous development of their nation.

POPULATION EDUCATION AND THE SCHOOL CURRICULUM*

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Some Implications of the Population Situation

The implications of certain features of the population situation, as at present and as projected for the future in the countries of Asia and in the world as a whole, are such that the conclusion is irresistible that no social problem which concerns man—as an individual, as the member of a family, as the citizen of a country, and as a member of the world community—is of as much importance for the future of his existence as the problem, or the complex of problems, associated with the growth of population. A few of the more important implications may be summarised here.

1. Early this century, Charles Darwin, in his well-known classic *The Origin of the Species*, made the following comment : "Even slow-breeding man has doubled in twenty-five years, and at this rate, in less than a thousand years, there would literally not be standing room for his progeny."¹ It is now realised that Charles Darwin made an under-estimate, and that in a matter of six or six and half centuries from now there would be less than one square foot per human being, less than standing room, in fact. Civilised life would be impossible then, and possibly even a century or two before then or, in other words, four or five centuries from now, which is indeed not a great deal of time ahead from the present. We need not, however, look that far to appreciate the gravity of the problem. A doubling of the present population of the world will require about 30 years from now, and each further doubling will require less and less time.

2. In so far as Asia is concerned, it is the continent which exemplifies the problem of population in its most acute form. Asia

*Text of a lecture delivered at a Workshop on Population Education organised at the Zamora Elementary School, Manila by the Bureau of Public Schools, Republic of the Philippines.

1. Darwin, Charles. *The Origin of the Species*. New York, 1907.

has more than half the world's population, though the extent of land occupied by it is only twenty per cent of the total area of the earth. In spite of the most determined efforts of the nations concerned to develop their educational systems, the race against population growth has been a losing one. There are more illiterates, aged 15 years and above, in the Asian region now than there were twenty years ago ; there are more children, aged 5 years to 19 years, out of school now than there were twenty years ago. Far from increasing current educational enrolment ratios, which are already too low, maintaining even these ratios in the future for the increasing population has become an up-hill task.

3. A rapid rate of population growth has served to limit investment, the capacity for economic growth and the potential rate of growth of average income, thereby reducing the pace of improvement of standards of living and the quality of human life.

4. The problems of urbanization loom large over all nations, both developed and under-developed. Shortages of housing, water supply and sanitation combine with water and air pollution to constitute grave hazards to human life in all thickly populated areas.

These features of the demographic situation have no doubt contributed in substantial measure to the malaise of crime, violence, conflict etc., that is manifesting itself in a myriad forms in all countries of the world. Its genesis may lie largely in the revolution in men's minds and actions that has sprung from the frustrations of modern life and the unfulfilled expectations of a better future that was hoped for but is found incapable of attainment.

The Importance of Population Studies

Clearly, from whatever angle we look at it, the rapid growth of population presents an issue of momentous significance for man, and no educational programme that makes any claim of relevance to human issues can ignore it. For some time past, a few educators have been forcefully arguing the case for the inclusion of population studies in the curriculum. In 1962, Warren S. Thompson wrote in the *Teachers College Report* as follows : "In regard to education, I assume that the purpose of formal education in a democratic society is to prepare our youth to cope more effectively with the increasingly complex problems of modern society in matters that come within the competence of the mass of citizens to decide. This can probably best be done by giving the student the facts needed to

provide him with a basis for the intelligent consideration of social policies intimately and directly affecting him and his family. Such policies must be decided at the 'grass roots' if they are to become effective. Certainly, no basic policy aimed at controlling growth can be effective when imposed from above... The presentation of the essential facts must, of course, be accompanied by as thorough and objective discussion as possible."² Writing in the same issue of the *Teachers College Record*, Philip M. Hauser lamented the fact that the heightened interest among various groups and agencies all over the world in population matters "has had relatively little impact on the school curriculum."³ He went on to point out that the facts and implications of population changes were indeed "conspicuous by their absence or by their superficial and cursory treatment" in education, and argued that information about population should be regarded as an "essential part of a general education."⁴ During the three or four year period immediately preceding 1970, a few attempts were made in South America, the United States, and India to introduce population materials into the curricula of a small number of schools in these countries. From 1970, however, Unesco has entered strongly into the field of population education. A Workshop on Population Education, held in Bangkok in Sept. 1970, broke new ground, and its Report is perhaps the most comprehensive statement available anywhere in the world on the field of population education.⁵ The Workshop has served to stimulate a great deal of interest in the countries of the Asian region. Some of them have organised national workshops as a follow up on the Bangkok seminar, and produced experimental materials for introduction into schools. Three Asian countries, apart from India, that have shown great initiative in this field are the Republic of the Philippines, Republic of Korea and Taiwan.

A Comment on Terminology

While Warren S. Thompson and Philip M. Hauser were the first to urge the inclusion of population studies in the school curriculum, it was the task of other educators to give concrete shape to a programme. One of the pioneers in this field is Sloan Wayland, and it is to him that the term 'population education' appears to be

2. Thompson, Warren S. "The Population Explosion", *Teachers College Record*, Volume 63, 1962, p. 416.
3. Hauser, Philip M. "Population—gap in the curriculum", *Teachers College Record*, Volume 63, 1962, p. 425.
4. Ibid., p. 426.
5. UNESCO. *Regional Workshop on Population and Family Education. Final Report*. Bangkok, 1970.

owed.⁶ He was interested in the introduction of population studies into a school curriculum, and he noted that the terms "sex education" and "family life education" which were in current use in the West before there was any concern about population studies had been used by some to encompass the new field. He was not in favour of the use of these terms as the substantive content and focus in the new field were different. Moreover, he thought it best to use a term which did not evoke "negative responses by educators and the public." For these reasons, he suggested the term "population education". His views on the content of the field were as follows : "... we are concerned about the inclusion in the formal educational system of instructional settings in which young people will come to understand the circumstances which have led to the adoption of family planning as public policy and to understand that for the family and the nation, family planning is possible and desirable. This would include an understanding of the relationship of population dynamics to economic and social development of the country and the implications of family size for the quality of life of the individual family." In a list of six basic topics given by him in another article, Wayland includes "development of basic understanding of the process of human reproduction."⁷ It will be seen therefore that certain elements of family life education and sex education are included in Wayland's concept of population education. Noel-David Burleson has used another term, namely "population awareness" in suggesting materials for inclusion in the school curriculum.⁸ A narrower scope than that envisaged by Wayland appears to be implied in the use of the term population awareness. Thomas Poffenberger defines population awareness as "the communication of those aspects of population dynamics which indicate the significance of population growth in terms of its social, economic and political consequences for a given area".⁹ Unesco appears to favour the term "population and family education", judging from the way in which the theme of the Bangkok Workshop of 1970 was titled. A difficulty in adopting this term is that in order to justify the use of the

6. Wayland, Sloan. "Population Education in Developing Countries" in Mehta, T.S., Parakh, B.S., and Saxena, R.C. (Eds). *National Seminar on Population Education*, New Delhi, 1969.
7. Wayland, Sloan. "Population Education, Family Planning and the School Curriculum", *The Journal of Family Welfare*, Vol. 15, 1968.
8. Burleson, Noel-David. "The School and Population", Center for Studies in Education and Development. Harvard Graduate School of Education, mimeo.
9. Poffenberger, Thomas. "Population Education in Developing Countries." Center for Population Planning, University of Michigan, mimeo..

term the whole area of family relationships will have to be included, although much of it would have no relevance to population issues. In the circumstances, a great deal may be said for the adoption of Wayland's term "population education," including in the content such elements of family education and sex or reproduction education as are logically related to population issues.

The Content of Population Education

In considering the potential content of population education, it is proposed to adopt the approach of looking at in a total perspective that would bring within it whatever appears to be logically related to it. Five broad areas within which the content appears to fall may be demarcated.

A. The collection and analysis of population data.

A detailed break up of the content under this head would be as follows : methods of collecting population data ; the demographic processes of birth, death and migration ; calculation of birth, death and growth rates ; the age structure of a population and the causes underlying different kinds of age structures ; determinants of fertility, morbidity and mortality ; trends in population growth ; refined indices of fertility and mortality.

B. Population growth and human development

At the macro-level of the nation, the topics to be considered would be the relationships between population growth and such variables as land and natural resources, agriculture, food, housing, employment, economic development, educational development and the development of health services.

At the micro-level of the family, the topics to be considered would be the impact of family size on the quality of life in the family and aspects of development of the individual.

C. The problem of urbanization.

D. Psycho-social aspects of human sexuality. The reproductive process.

E. Population planning.

The objective of a course such as that outlined above would be to give the learner an insight into the totality of issues connected with population, ranging from the nature, measurement, causes, determinants and consequences of population growth as well as of urbanization both at the micro-level of the family and at the macro-level of the community, the nation, or the world at large to the

dynamics of the reproductive process, and finally to the possibilities of planning family size and population growth. Hopefully, the acquisition of such an insight may succeed in providing the learner with a sound cognitive and attitudinal basis that would contribute to rational decision making both as an individual and as a member of society, when occasions for such decisions arise. An obvious situation in which a personal decision will be involved will arise many years later, in adulthood, when the learner would be faced with the process of decision making in relation to reproductive behaviour, not in the insulated atmosphere of a classroom but in an emotionally charged socio-psychological context in which both individual urges and role expectations, as a husband or wife, and as an adult member of a social group, would powerfully affect decision making and action. While it would be idle to pretend that exposure to a course on population education would definitely ensure a decision that is productive of both individual and social good, it is reasonable to expect that the probability of a rational decision from a person who has such educational experiences is much higher than from a person who has not had an orientation to population issues.

It has to be recognised that much of the current interest in population education has arisen from the need to reduce the rate of population growth in many parts of the world by encouraging in these areas the wide adoption of a small-family norm in the hope that reproductive behaviour would be in accordance with such a norm. The unmistakable specificity of this all important long-term objective makes population education different from almost every other educational activity that is usually undertaken in our educational institutions. Educators are, however, agreed that the best educational preparation for the achievement of this objective is to promote the development of an insight into the impact of population growth on the quality of life by means of a programme that is untarnished by any kind of crude propagandist emphasis. Stephen Viederman says, "The aims of education are to increase awareness, and, hopefully to help us achieve wisdom in the conduct of our lives, both as individuals and collectively. These aims are shared by the new field that has come to be called population awareness education. . . . population education aims at developing informed individuals who will, as a result of the knowledge and understanding achieved through their education, make responsible decisions concerning their own reproductive behavior. The key concept is responsible decision making which involves foreknowledge and understanding of the consequences of one's actions. This is the

beginning of wisdom, and represents the moral and ethical purpose of population education".¹⁰

Over and above any pragmatic objective related to the small family norm or the limitation of population growth, population education, in the hands of an imaginative teacher sensitive to the analysis of dynamic relationships between inter-connected variables opens up interesting possibilities of examining the inter-play between such variables and sharpening the insights of students. Population growth is a function of, or in other words, is dependent on, the three processes of natality, migration and mortality, each of which is in turn dependent on a number of determinants. Differentials in the nature and magnitude of the determinants in so far as they affect different groups of people or nations produce variations in natality, migration, mortality and finally in the size of the population and its growth rate. The age structure of a population depends on the pattern of increases or decreases in natality, migration and mortality and affects them in turn. So does the sex structure of a population. The potential number of school entrants, the burden of dependency, the potential labour force and the number of women of child bearing age also depend on the age structure. A change in the age structure would affect all of them. Economic growth depends on a number of variables such as savings, the size of the labour force, availability of land etc., all of which are dependent in one sense or another on population growth. Examples of this dynamic inter-play of variables encountered in the study of the nature and impact of population growth can be multiplied almost without limit. The exploration of such issues is without doubt a valuable and challenging intellectual activity that could lead to a deep appreciation of the relationships between man and his multi-faceted environment. Even such a mundane affair as the calculation and interpretation of population indices can lead to a heightened sensitivity to the meaning and significance of numerical relationships. Discussions of the basic weaknesses of crude birth rates and death rates and the dangers involved in generalising from them would lead to the development of a critical attitude towards numerical relationships. An understanding of standardisation as a method of ensuring comparability, and of the calculation of age-specific fertility and mortality rates, standardized rates and reproduction rates as a method of obtaining more and more refined measures to describe phenomena, will provide an effective illustration of the

10. Viederman, Stephen. "Developing Education Programs for Population Awareness", The Population Council, New York, mimeo, October, 1970.

purposive activity of the human mind in its search for more and more meaningful ways of comprehending the processes that go on around him. It will be seen from these examples of the educational possibilities of population studies that, in the hands of a knowledgeable and imaginative teacher, population education could have distinctive educational uses to warrant its inclusion in the school curriculum, apart from any pragmatic purpose that may be achievable in the long run, and for which a sound cognitive and attitudinal basis may be laid in school.

Some Problems In Introducing Population Education

In connection with the introduction of population education into the school curriculum, note will have to be taken of

- a) the views of parents regarding the advisability or the appropriateness of including certain topics,
- b) the preparation of teachers to handle population education,
- c) the age levels at which different topics should be introduced, and the key concepts to be emphasised at each age level,
- d) the subject matter areas through which the topics, and the key concepts involved in them, could be introduced,
- e) the lack of relevant research data, especially on the motivational issues.

a) It is possible to distinguish within the field of population education certain topics which are non-controversial, the presentation of which to children would be readily accepted by all parents, and certain other topics about which parents may have reservations. Any attempt to thrust on the school elements about which parents have reservations would be to endanger the entire programme of population education. Where some elements in the proposed programme do not meet with the approval of parents, the best policy would be to act in accordance with parental wishes and to accept the position that children would derive benefit even if they are exposed only to the remaining part of the programme. What may be desirable or feasible in one country may not be desirable or feasible at all in another, and the need is to adopt a strictly pragmatic approach that is sensitive to social pressures. A topic that may create a certain amount of difficulty is that relating to sexuality. It is not only in the Asian countries that this topic could present difficulties. Thomas Poffenberger says "...the introduction

of sex education and family life education programs and their continuation, has not always been smooth either in the United States or in European countries, and in the last few years parental opposition and vested interest group opposition seem to have increased. In Sweden which has had one of the most active sex education programs in Europe, a review of school policies has been undertaken. In the United States there has been growing opposition to sex education programs in the last year or so".¹¹ Poffenberger also refers to a developing country (not mentioned by name) in which "the wide publicity given the program before any planning and the use of the term 'sex education' had increased the difficulty of adding any population material to the curriculum." This situation shows the dangers involved in trying to include material that may not be favoured by parents. The moral for curriculum planners is to develop a sensitivity to parental opinion and public opinion, and to go ahead with such parts of the programme as are acceptable to parents and which would achieve the objective of the programme even partially though not wholly. Several writers on population education have been careful to stress such a point of view. Harold Howe writes as follows: "Population education is not family planning or birth control education although these topics are related and relevant. Population education is merely instruction in the dynamics of population without the emotionally charged areas of sex, birth control and family planning. The consequences of a rapidly growing population can be taught in an objective, non-sectarian manner without examining areas likely to raise governmental and parental opposition or to create discomfort among instructors. The content of population education is more palatable or less controversial for both the teacher and taught than birth control and family planning concepts. It is geared to the creation of a desire for information about these fields but with a more proper understanding of their function than has usually been encouraged before: it seeks to implant an understanding that a planned, small family is desirable if national and personal development are to be possible."¹² Edward W. Pohlman and K. Seshagiri Rao argue that while an understanding of sex gives a more complete picture to population education, it is not essential and that "one can teach about (1) population dynamics and the problems of over population, (2) advantages of small families and (3) advantages of later marriage with-

11. Poffenberger, Thomas, *op. cit.*

12. Howe, Harold. 'Some Guidelines for Introducing Population Education in Schools', in Mehta, T.S., Parakh, B.S., and Saxena, R.C. *op. cit.*

out discussing sex or contraception in any way."¹³ They point out that the "population crisis is a matter of life-or-death urgency" and as such demands priority. They do not want to risk population education being involved in controversies about sex or contraception education, for they feel that parents and community leaders "who would accept population education alone will block any efforts to teach a combined programme." To cut a long story short, the trend of thinking among many educators is that population education is of such vital importance, even in dissociation from sex education and family education, that the surest way of ensuring its acceptance in the school curriculum is to concede this dissociation both in theory and practice. None of them would oppose sex and family planning education, if the community of parents and teachers wanted them; if they are included, perhaps population education would be complete in all its elements. But if communities are wary about sex and family planning education, let this not stand in the way of the introduction of a population education which is, using the words of Pohlman and Rao "clearly and loudly divorced from sex education, family life education and contraception education."

Another issue that could raise complications is a propagandist emphasis on the small family norm. To be sure, the acceptance in word and deed of a small family norm is essential in the case of the people living in many parts of the world, and especially the under-developed countries of Asia, if population education is to achieve one of its most important purposes, but this acceptance must come at a mature level of understanding on the basis of an intellectual appreciation of the advantages of a small family norm from the point of view of both the individual and the community at large. Any attempt to press home the small family norm prematurely at a simplistic level, without allowing the norm to crystallise as a result of an increasing awareness of its advantages, may result in disturbed inter-personal relationships within the child's own family constellation, if the manifest norm in it is that of the large family. In a talk delivered at a national seminar on population education held in Bombay in 1969, Dr. V.K.R.V. Rao, the Union Minister of Education and Youth Services of the government of India pointed out the danger of creating in children "feelings of disaffection for their parents and hatred for brothers or sisters in case they constitute a

13. Pohlman, Edward W. and Rao, K. Seshagiri. "Population Education Versus Sex Education" in Mehta, T.S., Parakh, B.S., and Saxena, R.C. *op. cit.*

large family."¹⁴ Apart from this danger, which could be quite real, there is the possibility that if population education is perceived to be both propagandist and out of tune with an accepted norm it is likely to be resisted. Research on communication carried out by C.I. Hovland, I.L. Janis and H.H. Kelly shows that communications which are regarded as instructional rather than persuasive are more readily accepted.¹⁵ One characteristic of an instructional communication is that conclusions are incontrovertible and likely to be socially rewarded in accordance with the norms of people important to those receiving the communication. Where there is a disjunction between the message of the communication and the norms of the persons important to those receiving the communication, the message is likely to be resisted. Hovland, Janis and Kelly point out that "to the extent that the latter conditions prevail, it is always an open question whether the effort is warranted." The moral from this is to desist from giving population education a propagandist flavour and to present the facts as objectively as possible at the learner's level of understanding, leaving it to the facts themselves to throw up in course of time the essential lesson to be learned from them. It is by this means that the possibility of rejection, arising from dissonance with existing norms, can be minimised. The importance of a subtlety of approach that eschews propaganda cannot be over emphasised, if population education at the school level in the developing countries is to achieve its long term objective of encouraging the acceptance of a small-family norm.

b) An important pre-requisite before a successful programme of population education can be launched is the availability of teachers. The urgency of introducing population education is, however, such that much valuable time may be lost if we wait until fully prepared teachers are available. The need arises therefore to draw up short-term plans for getting programmes going with such introductory courses for teachers as are feasible, and long-term plans for a more comprehensive preparation of teachers. Sloan Wayland is of the view that "concentrated work for three to six months should be enough time for an experienced educator to develop a high enough level of competence to provide leadership" in

14. Rao, V.K.R.V. "Inaugural Speech" in Mehta, T.S., Parakh, B.S., and Saxena, R.C. *op. cit.*

15. Hovland, C.I., Janis, I.L., and Kelley, H.H. *Communication and Persuasion*, New Haven 1953.

developing programmes in the field of population education."¹⁶ The teacher's preparation should be comprehensive, and it should include all the elements of population education so that the teacher would be able to handle population education materials with accuracy and confidence. Though the subject matter of population education is of an inter-disciplinary nature, it is not intrinsically difficult, and in so far as the teacher is concerned a single unified course would probably meet his needs, provided he engages in a dedicated effort on his own to keep in touch with relevant literature in the field and progressively acquire mastery over the field. Any temptation to entrust the subject to very inadequately prepared teachers should be resisted, for it could yield more harm than good. Some statements in Gilbert Highet's book *The Art of Teaching* are of interest in connection with the teacher's preparation and task. "One cannot understand even the rudiments of an important subject without knowing its higher levels at least, not well enough to teach it. Every day the grossest and most painful blunders are made...by teachers...because they confidently state a half-truth which they have read in an encyclopedia article, or because they lay down as gospel a conjecture once uttered by an authority they admired. And many teachers, trying to explain certain problems in their own subjects, fall into explanations suggested them by a colleague or thrown up by their own imagination, which are nevertheless totally wrong, and which an extending knowledge of the field would have corrected long ago...it is simply useless to teach a child even the elements of a subject, without being prepared to answer his questions about the upper ranges and the inner depths of the subject...A limited field of material stirs very few imaginations. It can be learnt off by heart, but seldom creatively understood and never loved. A subject that carries the mind in limitless journeys will, if it is well taught, make the learner eager to master all the preliminary essentials and press on."¹⁷

India and the Philippines seem to be the only two countries in Asia which have made some sort of a start in the preparation of teachers of population education. In both countries, a number of short workshops have been conducted for teachers during the past one or two years. In so far as universities are concerned, the Faculty of Education and Psychology of the M.S. University of Baroda in India has established a Population Education Centre. This centre is

16. Wayland, Sloan. "Issues and Problems in Introducing Population Education", Teachers College, Columbia University, mimeo, March 1971.

17. Highet, Gilbert. *The Art of Teaching*.

trying out a course of extension lectures on population education with its Bachelor of Education students. A few post-graduate students of the university have commenced work on research studies in the area of population education. In the Philippines, the Philippine Women's University in Manila and the Wesleyan College, Cabanatuan City have initiated courses in the field of population education. The Unesco sponsored Asian Institute for Teacher Educators located in the University of the Philippines is at the present time providing an introductory course on population education for 22 key teacher educators from the Asian region enrolled in it for a three-month course of studies. It is hoped that many of them will take the initiative in developing courses on population education in the teachers' colleges in their own countries. In India, the Indian Association of Teacher Educators has already made an appeal to the teachers' colleges of the country to conduct extension lectures for teacher trainees to orient them in the concepts and methods of population education. In a matter of months, or at any rate within a couple of years, the demand for such courses is likely to be widespread in all the countries of the Asian region. The Bangkok Workshop of 1970 "emphasized the high priority that needs to be given to the adequate in-and pre-service preparation of teachers if the implementation of a Population Education Programme" is to succeed, and made a number of recommendations to be implemented at the national level and at the international level.¹⁸

c) There has been a certain amount of controversy as to the age levels or school levels at which materials on population education should be introduced. The arguments for introducing population education at the elementary or primary school level are as follows :

1. The highest enrolments in education are in the elementary or primary grades, and population education should be introduced in these grades to enable the largest number of children to be reached. Children drop out of the elementary or primary school as they go up the school, and the number of pupils joining secondary schools is only a small fraction of those who were in the early grades of the elementary or primary school. If the introduction of population education is postponed until the secondary level, many will not get it at all in school. Their chances of acquiring information about population matters

out of school are also limited, as many of them would not have attained a high standard of literacy. Moreover, in the villages in which they are more likely than secondary school leavers to reside, opportunities of exposure to the mass media are restricted. In view of the wider prevalence of large-family norms among rural folk than among town folk, the need to canvass the rural folk is very great, and it is by the inclusion of population education in the elementary or primary school curriculum that this objective can be achieved.

2. The elementary or primary school curriculum usually provides a great deal of flexibility for the introduction of new materials. In very many countries, there is no great concern with examinations at this stage, and therefore the constraints on the use of experimental materials are relatively few.

There is great substance in these arguments but their limitations should be understood. If the intention is to reach the largest possible number of children, then population education should be introduced into the lower grades of the elementary or primary school. The development of materials at a relatively simple level of intellectual sophistication is no easy task, and there is a certain danger that the concepts in population education that are to be introduced may undergo a considerable over-simplification in the process. Moreover, the earlier a child is introduced to population education the greater will be the distance in time between his exposure to the programme and his decision making processes in relation to population. What evidence do we have that such early exposure, without any exposure at all during the intervening period, would affect decision making and reproductive behaviour fifteen to twenty years later? If our objective in introducing population education at the elementary or primary school level is limited to making children conversant with simple population data and with population growth as an issue that touches human life and society at a number of points, it should be possible to give such an awareness without necessarily claiming a successful inculcation of the small-family norm and decision making many years later in accordance with it. In other words, modest objectives that prepare the ground

for the attainment later of larger objectives may be achievable at the elementary or primary level. It would be realistic to admit that both those who are exposed to the programme in the elementary or primary school, and those who are not exposed to the programme as they have dropped out of school would need exposure to population education in their middle and late adolescence, if their reproductive behaviour is to be influenced. Such exposure will have to be provided through programmes in secondary and tertiary level institutions for those adolescents attending them, and through out-of-school youth and adult education programmes for the others. Naturally, in the case of the latter the emphasis could be placed more markedly on the small-family norm and on family planning than on other issues related to population growth. If this argument is accepted, its moral for the introduction of population education materials at the elementary or primary level is that every natural opportunity for introducing population related materials should be availed of by the teacher, with due regard to the cognitive development of the pupils. There should be no straining to inject material artificially, especially material of a kind for which the justification lies in the hope that it would bear fruit fifteen to twenty years later. It is especially important that teachers introducing population education at the elementary or primary school level should bear in mind V.K.R.V. Rao's caution, quoted earlier, against creating in children feelings of disaffection towards their parents and siblings. While this caution is not unnecessary at the secondary school level, it is in respect of the elementary or primary school child that it has to be strongly emphasised for two reasons. Firstly, the child is more pliable emotionally and less able to see situations in a total perspective. Secondly, if the subject of family size is presented at all at this stage, it is likely to be presented in an over simplified manner that could sow the seeds of disaffection.

The arguments urged for the introduction of population education at the secondary school level are as follows :

1. Curricular materials are easy to prepare for the secondary level than for the elementary or primary level. This is so as secon-

dary pupils have a broader experience than elementary or primary pupils. Being older and more mature, they would be able to appreciate in some depth the relationships between population growth and other variables. Opportunities for the introduction of population education materials will be available in a number of subjects of the secondary curriculum.

2. In view of the fact that secondary level enrolments are low, the number of teachers required for introducing population education would be smaller than the number of teachers required for introducing population education at the elementary or primary level.

3. As secondary pupils are only a handful of years away from the time when they would make decisions regarding marriage and reproduction, a programme of population education would be full of meaning to them and may make an impact on their decision making processes in these areas.

Little doubt exists about the appropriateness of population education for pupils at the secondary level. Even if students have been exposed to relatively simple programmes of population education at the elementary or primary level, the secondary level would sharpen whatever insights they have gained. Moreover, certain issues that may have been mentioned only incidentally at the elementary or primary level can be emphasised. It should, for example, be possible to discuss with secondary pupils in a comprehensive manner the factors that have led the people in many societies to adopt a large—family norm, examine the appropriateness of such a norm in the context of the world of today, and attempt to inculcate in the pupils the ideal of small-family norm.

d) While a single unified course on population education may be the best means through which teachers of population education may be prepared, in the case of children at the elementary or primary level it is perhaps out of the question trying to introduce population education as a distinct subject. The approach should be to introduce population related materials through such subjects as literature, history, geography, social studies, mathematics, general science and health education. This should be the approach with secondary pupils, too, in the first few years of their course at least, but a wider range of subjects than at the elementary or primary level, namely such additional subjects as biology and economics, would be available and make treatment in depth possible. With pupils in the last year or the penultimate year of secondary school, there

may be a case for providing a short, unified course, say, of one hour's duration a week for about ten weeks, to consolidate and integrate the knowledge and insights the pupils have gained into the problems of population growth through their exposure to population related materials in the subjects they have studied during the previous five or six years. A short course of this nature is unlikely to be regarded as a burden on the curriculum, and it should be possible to accommodate it without difficulty in the school time table. Apart from the advantage in drawing together and integrating ideas and concepts in population education that have been acquired over the years through the different subjects of the curriculum, the inclusion of a subject designated 'population education' in the final or the penultimate year of the secondary school would give a certain independent status to this field of study. At this juncture in the development of population studies, the acquisition of such a status may well make it a talking point among parents and the general public, and give the subject an importance that would be conducive to its further development.

The introduction of population related materials into the various curricular areas assumes that syllabuses of study in these curricular areas have a flexibility that permits such a procedure. If, on the contrary, there is no such flexibility, the task of the teacher would be made all the more difficult and it would require a great deal of ingenuity on his part. It is important to ensure that the introduction of population related material takes the form of a natural integration with other content rather than a straining of such content to accommodate the materials in an artificial or unnatural manner. When occasion arises for syllabus revisions, as is usually the case every two or three years in most school systems, full use should be made of the opportunity to open up possibilities of introducing population related material at appropriate points.

As a practical measure, it is useful to identify the concepts that should be introduced in population education, and to examine each concept carefully with a view to determining the curricular area or areas through which it could be introduced and the depth at which it may be introduced at each possible level.

e) The effective inculcation of the small-family norm requires among other factors an understanding of the motivational basis underlying the large-family norm in different socio-cultural groups. Research done so far to unravel this motivational basis is quite inadequate, and a great deal of further work is needed. The generally available research findings are based on responses to questionnaires

that have been administered in connection with K.A.P. (Knowledge—Attitude—Practice) surveys. Their response validity, especially on motivational issues, is greatly to be doubted. This is borne out by the fact that findings from questionnaire studies are seen to be not supported when interviewing in depth is undertaken. The latter has so far been done only on a small scale on account of the shortage of personnel to undertake such studies. Teachers who are interested and prepared to undergo suitable training could prove quite active researchers in this field, and help in gathering data about the motivational basis underlying the large-family norm and the barriers to the inculcation of a small-family norm and the acceptance of family planning. Every socio-cultural group has its particular ethos surrounding these issues, and population education as well as family planning propaganda should take account of it, if success beyond a certain point is to be achieved. Some success will be achieved even through a general programme that ignores specific motivational factors, but this is an illusory kind of success. For success beyond a certain point, the hard core of non-acceptors of the small-family norm and family planning has to be satisfactorily tackled, and for this purpose a clear understanding of motivational issues is required. It may be because of the neglect of this factor that in India during the past two or three years a plateau has been reached in the number of acceptors, in spite of an increasing deployment of personnel and money. The involvement of teachers as population educators makes available a leadership of great potential for participation in population activities, and many new dimensions may be added to programmes as a result of their leadership.

Conclusion

I have endeavoured to provide a broad perspective of the field of population education. There are many issues which I have not touched—for example, the role of the teacher in providing population education to out-of-school youth and adults. This is an activity which is all important in the sense that this group is on the threshold of their reproductive behaviour, and if aimed at this target group we are likely to realise rich dividends. I hope that population educators would not confine new expertise to the school only but reach out to society at large, and contribute in whatever measure possible to the solution of the problems lying ahead in the field.

THE NEED FOR EDUCATION FOR POPULATION AWARENESS*

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The term "Population Awareness" appears to have been coined first by Prof. Noel-David Burleson to refer to factual knowledge about population dynamics required to understand the nature and magnitude of the burden imposed by rapid population growth. With such a broad connotation, education for population awareness can encompass within its scope all efforts to inform the population about this problem. However, the theme of the present Conference is "Population Education for the Younger Generation", and as such we need to consider the subject from the point of view of the introduction of some teaching of these issues in our schools and colleges.

This aspect of the problem and its mechanics could perhaps best be discussed by an educationist with some first hand experience of teaching the relevant materials in our schools and colleges. I am only an economist-demographer and can claim no competence to discuss these very vital issues. My task is only to present what in my opinion is a strong case for the introduction of some instruction on this subject in our schools and colleges. For this propose, I shall discuss with you the available information on trends in population growth in India, their determinants and consequents. For many of you, who are already conversant with the various dimensions of this subject and in fact are doing something actively about it, my talk may well be superfluous.

Trends in Population Growth in India, 1908-1961

In Table 1, I have summarised the salient statistics about the size of India's population and some of its characteristics, as reported by or estimated from our decennial censuses. As most of you are aware, the next census was to have begun on the 10th of February and only because of the elections has it been postponed to the next

* Repaint from the report of the proceedings of the Seventh All India Conference of the Family Planning Association of India held at Manipal from 14th to 18th February, 1971.

month. So far, even the preliminary estimate of the population based on the house listing operation completed by October 1970, has not been released because, I am told, some areas have not yet sent the necessary information to the Office of the Registrar General in Delhi. I therefore apologise for concentrating on the data which are about 10 years old. However, I shall try to discuss the future prospects on the basis of available official projections of the population and some other estimates.

TABLE I
SELECTED STATISTICS ON THE POPULATION OF INDIA

Year	Population (in millions)	Percent- age varia- tion over the decade	Density per sq. mile	Number of males per 1000 females	Percentage literate in popula- tion aged 10 and over (a)	Mean age at marriage in years (b)	Males	Females
Census Count							Males	Females
1901	238.4	—	193	1029	11.5	0.7	20.07	13.15
1911	252.1	+ 5.75	205	1037	12.6	1.1	20.27	13.17
1921	251.3	— 0.31	204	1047	14.2	1.9	20.74	13.66
1931	279.0	+11.00	226	1053	15.4	2.4	18.66	12.68
1941	318.7	+14.22	259	1058	27.4	6.9	19.94	14.71
1951	361.1	+13.31	293	1057	29.6(c)	9.3(c)	19.92	15.59
1961	439.2	+21.51	356	1063	43.6(c)	15.5(c)	21.32	15.86

(a) For the period up to 1941, the figures relate to India and Pakistan together.

(b) For the period up to 1931, the figures relate to India and Pakistan together.

(c) Crude literacy rates, defined as the percentages of literates among the total population in 1951 and 1961 were as follows :

Census	Persons	Males	Females
1951	16.6	24.9	7.9
1961	24.0	34.4	12.2

It is evident from Table 1 that the population of India did not really increase significantly until 1921. It was after 1921 that the average annual rate of growth of population began to exceed one per cent per year and only during the nineteen fifties did it begin to approach two per cent a year. The rise has been rather sudden. This increase in the rate of growth is quite substantial, but even more impressive are the figures of the absolute increase in the size of population. Thus during 1951 to 1961 our population increased by about 78 millions which was more than the total growth during the period 1901 to 1941.

Since international migration from or to India has been relatively inconsequential, the two determinants of the rate of growth of India's population have been the birth and the death rates. Unfortunately, our vital statistics system, which dates back to 1886 when

the then rulers of India enacted a law providing for the registration of births and deaths, is not good enough to provide reliable information on this subject. We therefore rely on rather indirect estimates, based on the extent to which persons of different age groups enumerated in one census survive to the 10 year older age group in the next census. These estimates have been summarised in Table 2 which shows the birth and death rates as well as the rates of natural increase. The table also shows the estimated average number of years for which a newly-born child can expect to live if he and others born with him were to experience, throughout their life time, the risks of death estimated as prevalent during the specified decade i.e. the expectations of life at birth.

TABLE II

AVERAGE ANNUAL BIRTH AND DEATH RATES AND LIFE EXPECTANCY AT BIRTH (BY SEX), IN INDIA BY INTERCENSAL DECADES, 1881-1960

Decade	Births per 1000 population	Deaths per 1000 population	Rate of natural increase	Life expectancy at birth	
				Males	Females
1881-1891	48.9	41.3	7.6	24.59	22.54
1891-1901	45.8	44.4	1.4	23.63	23.96
1901-1911	49.2	42.6	6.6	22.59	23.31
1911-1921	48.1	47.2	0.9	19.42	20.91
1921-1931	46.4	36.3	10.1	26.91	26.58
1931-1941	45.2	31.2	14.0	32.09	31.37
1941-1951*	39.9	27.4	12.5	32.45	31.66
1951-1960*	41.7	22.8	18.9	41.89	40.55

* Visaria's estimates (From : "Mortality and Fertility in India." *Milbank Memorial Fund Quarterly*, Vol. 47, No. 1, January 1969).

1941-1951	42.6	30.0	12.6	33.05	33.10
1951-1961	44.9	25.7	19.2	37.80	36.98

Sources : (1) Kingsley Davis, *The Population of India and Pakistan*, Princeton University Press, Princeton, 1951, pp. 62, 85.

(2) Census of India, Paper No. 6 of 1954, *Estimation of Birth and Death Rates*.

(3) Census of India, 1961 Census—Life Tables.

It is evident from Table 2 that the birth rate in India has remained more or less stable around 42-46 over most of the period under consideration. For the recent period there is some uncertainty about the precise level of the birth rate but it appears to be around 42 to 45. The slight decline from the high estimated birth rate of 48 or 49 is due almost entirely to a change in the age distribution of

the population. In other words, the number of births per woman in the reproductive ages has not really declined. But since the proportion of such women in the population has declined because of faster growth of population, the number of births per thousand population appears to be somewhat lower.

On the other hand, the death rate in India has certainly declined significantly after 1921. The expectation of life at birth has certainly increased. The availability of various antibiotics and sulpha drugs after the second world war and the control of malaria through the spraying of D.D.T. at a relatively small cost have been the major factors underlying the decline in the death rates and resulting acceleration of the rate of population growth. Of course, the decline in the death rates has been a very welcome development. No one likes to die and therefore the lower death rate and the higher expectation of life represent a major gain in the real income of our population during the post-independence period. Our achievements in this regard need not be underrated.

Implications of Rapid Population Growth

However, the implications of accelerated population growth for the success of our efforts for rapid economic and social development are not very satisfactory. Over the period 1950-51 to 1968-69, the aggregate national income of India at 1960-61 prices increased by almost 70 per cent, i.e. from Rs. 9,650 crores to 16,830 crores. But the per capita income has increased by only about 18 per cent from Rs. 270 to Rs. 319. In fact, between 1960-61 and 1968-69 the per capita income has increased by only 4 per cent from Rs. 307 to 319. Similarly, despite an increase of about 63 per cent in our agricultural production and of 70 per cent in foodgrains production, the per capita consumption of food has increased by only 10 per cent from 394 gms. per day in 1950-51 to 438 gms. in 1968-69. The objective of providing a fairly balanced diet to our population remains a distant goal. Despite a substantial expansion of our educational system and a rapid increase in the number of students, the target of providing free and compulsory primary education to all children below the age of 14 continues to elude us. As can be seen in Table 1, the increase in the literacy rate, both crude and for the population aged 10 years and over, during the nineteen fifties was far too slow. These illustrative statistics indicate how acceleration of population growth has led to a very thin spread of the benefits of economic development.

The advantages of slower population growth arise not only from the fact that the given national product would have to be shared among a smaller number of persons or consumers but also from the fact that when such growth occurs as a result of a decline in mortality rates unaccompanied by a corresponding decline in the level of fertility, the proportion of young children in the population tends to increase. In other words, the dependency burden on the working population rises. The attempt to overcome this through some participation in work by the young (under 15) or the old (over 60) does not really help because the productivity of such workers cannot be high. More importantly, the objectives of providing the necessary educational and health facilities to this growing number of young children requires the society at large as well as the parents to divert their savings to what is essentially a consumption activity. The available surplus of income over consumption (savings) is used to support the additional population at the existing low level of income instead of to improve the productivity and the income level of the population.

It is argued that the additional children, also represent potential earning capacity in the form of labour. However, there is no scarcity of human labour in our country. Our basic need is capital or machinery and plant and equipment which would improve the productivity of our labour. It is customary to illustrate this point by reference to the reportedly large and growing number of unemployed persons in the country. However, a Committee of Experts appointed by the Planning Commission to examine our estimates of unemployment, with which I was closely associated, has come to the conclusion that while there is considerable under-employment or under-utilisation of the available labour resources in the country, the number of wholly and openly unemployed persons is probably much smaller than was suggested by the earlier estimates. Of course, such unemployment as exists tends to be high among young persons in the age group 15 to 24 and causes frustration and discontent among our youth. Thus there is indeed a serious problem of finding jobs for the new entrants into the labour market, particularly for those who cannot start working on their family farm or the household industry.

It may be added that as a result of the acceleration of the rate of population growth in the 1950's, the number of persons entering the labour force during the years ahead is expected to rise steadily from an annual average of about 6 millions during 1961-66 to about 8

millions during 1971-76 and almost 10 millions during 1976-81. Our capacity to provide productive employment to such a large number of persons is indeed limited. Of course a large proportion of them will have to be absorbed in agriculture. But it is obvious that with almost 45 per cent of our total land area already under cultivation, the scope for reclaiming other land for agriculture is extremely limited and therefore the area of land available per agricultural worker will continue to decline. Fortunately, because of the availability and increasing adoption of high yielding varieties of seeds, the irrigated farms with multiple cropping are likely to be able to absorb additional labour without any decline in their level of income. However, in dry farming areas, which account for the bulk of our agriculture, the expected additions to the number of agricultural workers might well cause a significant rise in the number of landless workers and it can result in an explosive situation.

A higher pace of migration of rural work-seekers to urban areas does not offer a solution to the problem. True the level of urbanisation in India is not high. Yet, modern industry is generally capital intensive and the number of new jobs in towns and cities grow rapidly enough to absorb the increase in urban job-seekers through national increase as well as the present level of rural urban migration. The inadequacies of essential amenities in our urban areas are too well-known to require any repetition. There is great need to quicken the development of the non-agricultural sector within our villages but the organisational problems of such effort are simply stupendous.

One is often asked whether rising levels of income and economic development would not automatically lead to the voluntary regulation of the level of fertility and the adoption of family planning. Unfortunately the available information does not suggest any clear threshold in the level of development which would usher in a low fertility. In any case such a laissez-faire approach is inconsistent with planning for social and economic development and therein lies the rationale of a deliberate policy of promoting family limitation by various segments of population. Of course this is an effort at persuasion and education and does not involve any compulsion. Also, the goal is not to reduce the total size of population but to moderate the increase in the growth rate that has occurred and might continue to occur as a result of further decline in the death rate.

Some scholars doubt whether death rates can continue to fall or remain low in the absence of a considerable rise in the level of living of the people. It is difficult to be categorical on the subject

but certainly there is no necessary reason why we in India cannot enjoy the level of life expectancy that has already been achieved by the Western countries and in fact also by the small groups in our own population such as the Parsi community (whose expectation of life during the late nineteen fifties was probably close to 65 years). Also it would be only rational on our part to strive to prevent any possible rise in the death rates and to hasten the pace of economic development. All these considerations lend urgency to the efforts at lowering the level of fertility.

Admittedly, the task is not easy. Sex and reproduction are among the most intimate aspects of human behaviour. All of us are aware of the serious strain involved in adapting our set habits and even daily routine to altered circumstances. More importantly, there is an inevitable time-lag in the perception by the people of the altered mortality situation and its implications in terms of the number of surviving children and the problem of supporting and finding productive employment for them. A large majority of our people are not used to forward planning and anticipation of the future. Besides individual couples are naturally guided by their self-interest and view the additional children, particularly sons, as a likely source of additional income either from some urban job or from the farm. However, all of them cannot in fact succeed in such efforts because the aggregate impact of their efforts would be likely lower wage rate and a smaller or zero income for many of them.

However, the possibility of influencing the fertility of individual couples by highlighting the aggregate national or social problem (s) is perhaps limited. This explains the slower than anticipated success of our efforts to promote family planning through clinics and more recently through visits to individual families by the nurse-midwives attached to primary health centres.

A realisation of this situation is evident in the official population projections currently in use. Their main features are summarised in Table 3. The life expectancy at birth is expected to exceed 60 years during 1981-85. Consequently, provided that the general fertility rate (i.e. the number of births per thousand women in the reproductive age group 15 to 44) can be reduced by about 50 per cent from its level during 1951-66, the population of India would approach 75 crores by 1986. If the 1951-65 level of fertility remains unchanged, the population would exceed 75 crores by 1981 itself.

In Table 5, I have shown the possible population that India

TABLE III

VITAL RATES IMPLICIT IN OFFICIAL POPULATION PROJECTIONS
IN USE

Period	Birth rate	Death rate	Rate of natural increase	General fertility rate*	Life expectancy at birth	
					Males	Females
1961-65	41.0	17.2	23.8	195	48.7	47.4
1966-70	38.6	14.0	24.6	185	53.2	51.9
1971-75	35.1	11.3	23.8	167	57.3	56.0
1976-80	28.7	9.2	19.5	133	61.1	59.8
1981-85	22.7	8.2	14.5	100	63.1	61.8

* General fertility rate refers to the number of births per 1000 females in the reproductive ages 15-44.

Source: Office of the Registrar General, *Report on the Population Projections worked out under the guidance of the Expert Committee set up by the Planning Commission under the Chairmanship of the Registrar General, India*, New Delhi, 1969.

TABLE IV

PROJECTED TOTAL AND URBAN POPULATION OF INDIA DURING 1966-1986 ACCORDING TO THE OFFICIAL POPULATION PROJECTIONS

Year	Total population	Density per sq. mile	Urban population	Urban population as per cent of total
1966	495	401	94	18.91
1971	560	454	112	19.93
1976	630	511	132	20.90
1981	695	564	152	21.87
1986	747	606	N.A.	N.A.

Source : Same as for Table 3.

N.A. : Not available.

TABLE V

THE FUTURE POPULATION OF INDIA AND DENSITY PER SQUARE MILE (A) IF THE ANNUAL RATE OF GROWTH REMAINS CONSTANT AT THE AVERAGE FIGURE ESTIMATED FOR 1961-66 AND 1971-76, i.e. 2.38 PER CENT, AND (B) IF IT DECLINES TO 2 PER CENT DURING 1971-81, 1.5 PER CENT DURING 1981-91 AND 1.0 PER CENT THEREAFTER

Year	Constant growth estimates		Declining growth estimates	
	Population (in millions)	Density per sq. mile	Population (in millions)	Density per sq. mile
1971	557	452	557	452
1981	707	574	680	552
1991	897	728	790	641
2001	1,138	923	873	708
2051	3,740	3,035	1,439	1,167
2101	12,295	9,975	2,373	1,925

might have to support if the annual rate of growth were to remain unchanged at 2.38 per cent, which was the level during 1961-66 and is likely to be the level during 1971-76 also. In that event India's population at the turn of the century would be 114 crores, i.e. more than twice the population that the 1971 census is expected to enumerate. The extension of this exercise to the year 2051 and 2101 is intended to illustrate the explosive consequences of unchecked growth of population. Table 5 also shows that a faster decline in fertility and the rate of growth, faster than that envisaged in the official population projection, would result in a significantly smaller population at the turn of the century. Further, if fertility decline keeps pace with any fall in mortality, so that the growth rate remains constant at 1 per cent, the size of the future population would be much smaller than that expected from a continuation of the current rate of growth. However, the total population of India in the year 2101 according to either of the assumptions appears shockingly large, a prospect that should be avoided. These estimates are the basis of the conviction that in any finite space such as India (or even the world as a whole), the longterm rate of growth must be zero.

Education for Population Awareness

The preceding discussion shows the case for lowering the birth rate as rapidly as possible. For this purpose, a multi-pronged approach is absolutely necessary. There is a case for concentrating attention initially on persons most likely to respond favourably and set an example to others. Members of the armed forces and the employees in the public sector or the organised private sector probably constitute such prime target groups. Simultaneously, an attempt to inform all the married couples about the possibility of regulating the number of children seems desirable.

In this context, at least for the next decade or two, the role of education for population awareness is essentially one of supplementing the other programmes of promoting family limitation. It is only logical that an attempt to inculcate the small family norm in the minds of potential parents of tomorrow is made now. Of course, the results of any such effort would be visible after some time and not immediately. The evaluation of the programmes would not, therefore, be easy, and would require careful design of the experiments.

In India almost every one of us considers himself competent to recommend "the proper" policies in the field of education. In re-

gard to population education also, there has been a great deal of discussion during the past few years. The debate has often focussed on terminology the difference between sex education, family life education and the like. It is high time that something concrete be done. I am not really competent to discuss the phasing or the content of a programme of population education, and would abide by the advice of experts in the field of education. However, as an economist, I do feel that our first priority should be to focus attention on students who will be in the reproductive age group in the very near future, i.e. the students in high schools and colleges. The development of a modest information programme for this age group will not really be difficult and some concrete work can begin while we discuss and deliberate on the integration of population in the school curricula for different age groups.

Before concluding, I might rather cryptically state a few points on which some discussion and exchange of ideas might be possible at this Conference.

1. The main goal of education is to inculcate among the students a habit of rational evaluation of alternative courses of action and to provide the required factual information for the purpose. Here the broad objectives of education for population awareness and of education *per se* coincide. However, we must take care to emphasise that rational evaluation of alternatives should take into account not only the narrow self-interest but also broad social or national interest.

2. The adoption of improved varieties of seeds and other technological change in agriculture in certain parts of the country illustrates the possibility of altering customary modes of behaviour. The primary motivating force for change in this area was the possibility of economic gain. However, I am inclined to believe that the acceptance of such changes in one sphere indicates the likely greater receptivity of the relevant groups of population to changes in other aspects of life. We need to explore the possibility of combining population education with efforts to impart the knowledge of improved practices of cultivation.

3. The inhibitions of urban middle classes, from which many of us come, should not be the criterion for deciding the scope of information to be imparted to students. The natural curiosity of rural children who observe the mating of animals or birds should be satisfied in an objective and scientific manner.

4. Adolescents need to be taught certain essentials of the physiology of reproduction so that the onset of menstruation and/or impending marriage do not cause over-whelming anxiety and fear.

5. While population trends in small communities such as the village are difficult to measure and discuss, they can be used to emphasize the need for proper registration of vital events such as births and deaths.

6. The explanation of the dynamics of rapid population growth at the national or aggregate level needs to be combined with a discussion of the gains for individuals such as the health and the life expectancy of the mother. In this connection, a pointed reference is necessary to the fact that India is one of the very few countries in the world where females enjoy a lower expectation of life at birth than males. The intrinsic biological superiority of females is thwarted in India by our failure to pay adequate attention to their health and well-being and this situation must change.

7. Population education should include a strong emphasis on the fact that the long term rate of growth of population in this finite world must be zero. Control of births is, therefore, no more unnatural than prevention of deaths and, in fact, is a vital necessity for preserving the ecological balance in the world.

DEVELOPING EDUCATION PROGRAMS FOR POPULATION AWARENESS*

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Speakers on population matters exhibit a strong tendency to begin their talks with statistic-laden statements charting the rapid growth of world population in the last century. They are likely to refer to the population explosion and the population bomb. Speaking with an air of crisis they chart the perils of overpopulation and *population*, the term coined to cover the population-pollution interface.

I have no intention, however, to follow this formula in talking about population education. I do this not because I do not believe that various population problems do not exist in our societies but rather because these images of doomsday are not defensible for us in our role as educators.

The aims of education are to increase knowledge and ways of knowing, to develop understanding and awareness, and, hopefully, to help us to achieve wisdom in the conduct of our lives, both as individuals and collectively. These aims are shared by the new field that has come to be called population awareness education.

The goals of population education are to develop an understanding of the impacts of population characteristics and processes on national development both in the short and long run, as well as their impacts on the individual and his family. Thus population education deals with society at both the macro- and micro- levels. As such, it serves a dual purpose. First, it serves to develop an informed citizenry capable of understanding population characteristics and processes as they affect society, and capable of making responsible decisions with regard to public policy as it might affect, and be affected by, these processes. Second, population education

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aims at developing informed individuals who will, as a result of the knowledge and understanding achieved through their education, make responsible decisions concerning their own reproductive behavior. The key concept is responsible decision making which involves foreknowledge and understanding of the consequences of one's actions. This is the beginning of wisdom, and represents the moral and ethical purpose of population education.

The content of population education may vary from country to country, depending upon its educational traditions. One broad conception of the field was offered by a Colombian priest in conversation last September. He defined the part of population education as Love, the Family, Population and Development.

Love and the Family are encompassed by the fields traditionally labelled sex education and family life education. These deal with human relationships at the individual and interpersonal level. Human sexuality, human reproduction and the individual in the family are the focus of interest.

Population study involves introducing into the curriculum information concerning population characteristics and the causes and consequences of population change. This implies much more than simply a study of births, deaths, migration and growth rates. Among other things it includes an attempt to develop an understanding of a wide range of social phenomena that are closely linked with and affected by population such as urbanization and the role and status of women. Furthermore, since all demographic processes stem from the behavior of individuals, population study also attempts to elucidate the social and psychological bases for this behavior.

Population awareness education, therefore, differs from sex education and family life education, where the focus is primarily on the individual, by viewing the individual in the context of the broader society, relating his actions to this broader concern. And it is this linking of the individual to the broader society that forms one of the important elements in the entire process of development.

It is true that in many countries population education is being urged in response to a clearly defined "population problem". It is often suggested, as in this statement from India, that for family planning "to become a way of life, it must become, sooner or later, part of the general health and the social education necessary

to prepare the children for adult lives."¹ Population education, to follow this line of reasoning further, is viewed as a way of "ensuring continuing momentum to planned parenthood after crash programmes have ended."²

Without denying the validity of this approach, in that particular setting, I would like to suggest that it is too narrow a view of the field. Population education can be and is justifiable on strictly educational grounds. The characteristics of a population and the changes that occur in a population touch upon all our lives, whether we believe our country to be overpopulated or underpopulated. If it is educationally viable to study animal populations within the biology course of study, and I doubt that anyone would deny the value of this, then I suggest it is equally important that we include the study of human populations in our science, social studies and humanities curriculums. Thus, population education is as valid for countries such as Argentina and Japan, where there is an assumption that more rather than fewer people may be necessary for reasons of achieving an adequate labor supply, or economic growth, or other national goals, as it is for countries such as India and the United States who acknowledge in varying degrees their population "problems".

If we accept the importance and validity of introducing population education we are then faced with the problem of bringing about change in the educational system. There are now more than twenty countries throughout the world involved in the development of programs,³ and the number of approaches is almost as great. The size of the country, the nature of its educational system, its perception of a population problem, and the extent to which the impetus for population education comes from medical specialists in family planning, or from within the educational community itself, are among the more important variables in determining the road to follow in establishing a program.

As with any educational change it is important that there be a reasonably broad base of support. The movers in this field have found the workshop/seminar approach fruitful to expose and refine their ideas, and to motivate others to join with them.

1. *The Statesman* (New Delhi), December 2, 1969.
2. *The Statesman* (New Delhi), December 5, 1969.
3. See Stephen Viederman, "A Worldwide Review of Programs in Process and Planned," New York: Population Council, 1970 (mimeo). This review is being revised and updated for publication sometime in 1971.

For example, within the course of ten months, during 1969, there were three national conferences in India and many more regional conferences devoted to a discussion of population education. They were sponsored by the Family Planning Association of India, by the National Council of Educational Research and Training of the Ministry of Education, and by the Central Health Education Bureau of the Ministry of Health. Each resulted in a publication that has had wide distribution within the country.⁴ One potentially important result of these conferences was the establishment of a population education cell within the National Council with its own budget and staff to develop materials and plan research and training programs. The conferences also stimulated a wide range of other projects so that there are to-day probably as many as a dozen groups working individually and in concert on material development, teacher training and research.

In Chile the impetus for the development of population education has come from the Center for Training, Experimentation and Pedagogic Research affiliated with the Ministry of Education. Their program appears to be one of the most far-reaching now being developed anywhere in the world. As part of a general revision of the entire Chilean school curriculum, population-relevant concepts were developed. Materials were then written to include these concepts wherever appropriate to the content of the social studies curriculum at the upper elementary and secondary school levels. Additional materials as part of the biological curriculum are also being developed. In early September of this year the Center held a workshop in Santiago for Chilean teacher trainers from normal schools and from the universities to present their progress and their plans. The response was enthusiastic and it is likely that others will now join in the effort.

In Colombia, interest in population education has developed both at the University of Valle in Cali, and at the Colombian Association of Medical Schools where it is coupled with a concern for family life and sex education as well. During the first week of November the Association will sponsor a seminar to bring together

4. Seminar on Population Education for the Younger Generation, March 7-8, 1969, Bombay. Bombay : Family Planning Association of India, (1969); T.S. Mehta, et al, National Seminar on Population Education, August 2-3, 1969. New Delhi : National Council of Educational Research and Training, 1969; and Central Health Education Bureau, Group Reports of the Workshop on Health and Population Education. New Delhi : Central Health Education Bureau, manuscript.

a group of deans and professors of education and officials of the Ministry of Education for the pupose of reviewing possible programs for future development in Colombia. Among other things they will review with the educators the effect demographic pressures resulting both from the democratization of education and from the presence of larger numbers of school age children will have on the provision of educational services. The development of population education programs will be discussed as one of education's possible responses to these demographic challenges.

Having determined an interest in and support for population education, a review of world experience to this time suggests as a next step the creation of a population education unit or cell within the country's educational system. This group should define the purposes and goals of the program, co-ordinate activities to insure progressive and consistent program development, and plan and facilitate the necessary program development activities, including teacher training, the preparation of materials, the review of already existing curricula, program-related research, and evaluation. The group should be made up of professional educators who have developed competency in the area of population. They should be able to speak knowledgeably to teachers and to officials in the Ministry of Education.

Once the countries' specific goals and purposes are made clear, there will be a need to determine whether a series of new courses are likely to be most meaningful and effective, or whether population concepts should be infused throughout the school curriculum in all relevant subjects and at all grade levels. Although these approaches are not mutually exclusive and both new courses and infusion can be seen in most country programs, most of the persons specializing in this field give greater attention to the process of infusion. First, the demands of the traditional disciplines for more time as the boundaries of knowledge are pushed back generally preclude the possibility of adding new courses to the curriculum. Furthermore, population learning will probably be more effective if children are confronted with population-relevant material throughout their school curriculum and during their entire period of schoolgoing. Finally, the infusion of population education concepts may help to integrate student learning in a number of other curriculum areas that have perplexed educators over the years. Two brief examples from the United States may serve to illustrate this latter point.

International studies designed to increase the student's knowledge and understanding of the world in which he lives has been on the public schools' agendas since the late forties, at least, and has been a subject of major concern during the last decade. The problem has been to give the student a feeling for and a sensitivity to other cultures. All too often, however, the programs have been tours of exotica. Emphasis has been placed either on one culture region, to the exclusion of all others, or on a very broad survey of world cultures giving too little attention to any one. If the goal is to give the student an insight into how others view the world, neither approach seems to suffice. By making population study the focus of international studies programs, the student will be encouraged to understand the wide range of similarities and differences that exist in the world and the varying roles that politics, economics, culture, society and religion play in the shaping of policies, attitudes and actions both at the level of the individual and at the societal level.

Another task that faces the school is to encourage and assist the student to synthesize what he has learned, and to apply that knowledge and understanding to the real world in which he lives. Study of the impact of a zero rate of population growth on the society and economy of the United States offers a wide range of opportunities for the student to try to predict, and, hopefully as a result, prepare for the future. In the past, age pyramids—at least for the ages included in the labor force—have tended to mirror the organization and patterns of upward mobility of industry and of much of society. When that age pyramid begins to approximate a rectangle, as a result of a zero growth rate, what changes will have to take place within the society as a whole? And what changes may be necessary or inevitable when economic growth, which has been predicated at least in part on population growth, can no longer rely on that factor? Solutions to problems arising from a zero growth rate will not be easily found, but the student's search for understanding may help to give relevance and meaning to much else that he has been taught. And as a recent editorial in *Science* has suggested, "There is probably nothing more important to man's future on this planet than an understanding of the long-range effects of his activities."⁵

When we consider the possibility of infusing population-rela-

5. Singer, S. Fred, "Will the World Come to a Horrible End?", *Science*, October 9, 1970, Editorial.

ted concepts throughout the school curriculum, we soon realize that virtually no area of human knowledge covered by the curriculum is excluded. Some brief examples will suffice.

In art courses an aesthetic of space could be related to a discussion of population.

Information concerning balanced and unbalanced human and animal populations, and the ecology of population can be discussed with great relevance in biology courses.

Various mathematical concepts could be well illustrated through the use of population data. Concepts of numerical size—hundreds, thousands, millions and billions—could be taught using population data. The concept of compound interest could be learned as well from a study of population growth rates as from any other data.

Clearly the social studies offer a particularly fruitful area for population learning. The growth of world population can be traced, and the factors that affected that growth discussed, for their historical and contemporary relevance. Differences in belief systems—whether religious, political or social—could be reviewed with reference to their stands on the origins and consequences of rapid population change. Students might be encouraged to study population as a local phenomenon—taking a census of the community, learning of the past growth, and projections for the future, including among other things the need for new or expanded educational and health facilities, transportation and housing. This would demonstrate the difficulty of collecting data, the cautions with which one must approach the analysis of data, and would at the same time make the study of population a more personal and more relevant study.

It is clear that the opportunities for developing relevant materials for inclusion in the curriculum are many. Only hard work and imagination are needed.

As in the diffusion of any educational innovation it is advisable to introduce teachers to the programs as soon as possible. In fact, to the extent that it is practical and possible within the educational traditions of the country, teachers should be deeply involved from the very beginning. They, for example, are perhaps in the very best position to suggest and decide where best to infuse population concepts once the nature of population study is made clear to them.

It is highly desirable early in the program to develop a few

teachers who will be population education specialists. They would work closely with the population education unit within the Ministry of Education to insure that the program is teachable and workable in the schools.

However, it seems likely that we will not want to develop large numbers of teachers as population education specialists. Rather, we should attempt to infuse the content of population study into the teacher training curriculum in much the same manner that we are proposing for the elementary and secondary schools themselves. And any special methodology that might be developed for population education should be handled through the training in methodology that teachers now get in their regular teacher training. Special problems might be handled through the development of in-service and summer institutes as the demand seems to present itself.

Obviously, new materials both for teachers and students will have to be developed and existing materials revised in order to accommodate this new interest in population. One of the most useful projects to devote early attention to is the production of a reference book or guide for teachers. This might include a general introduction to demography and population study, as well as some of the basic data and information that might be useful to the teacher in lesson planning and classroom teaching.

Research and program evaluation should be included as part of the development of a national program from the very beginning. Knowledge of the nature of population learning and the developmental stages of population learning are obviously of the greatest importance to teachers and curriculum developers. Similarly, it is of considerable importance to know as the program begins what are the students' and teachers' knowledge of and attitudes toward population matters. These data are not only valuable to the curriculum planner; they also serve as a baseline for purposes of evaluation.

There is considerable room for co-operation between educators the world over in the development of this new field of education. The Population Council is particularly interested in facilitating this co-operation and communication through a variety of means. Ultimate responsibility for the development of a national program, however, must rest with the nationals of the country involved. They must be the creators of the new materials and the new programs, and not the consumers of others' packages. As was noted in a recent discussion of population education in Pakistan, "a good idea

or a good programme is not necessarily accepted just because it is good or even beneficial. Innovators introduced from the outside with whom the local person cannot identify himself meet with limited success. To promote new ideas they must be introduced by local leaders.”⁶

In concluding I should like to note that many Latin American friends and colleagues have suggested that population education cannot be introduced in Latin American schools. They argue that the word “population” conjures up images of population and birth control, which for various political, social, cultural and religious reasons, is not a very popular image at this point in history. I submit, however, that population education views population not as a problem to be controlled, but rather as a phenomenon—both social and biological—to be understood. As with all good education it does not teach an orthodoxy, but rather provides the student with ways of knowing and with the information that is known so that he can act responsibly. Thus, population education is no more nor less sensitive than anything else we may teach in the schools. It differs from much else we teach only in the sense that it may be more relevant to the students’ own life, both now and in the future.

If you agree, as I do, with the observation of the philosopher Alfred North Whitehead, that “there is only one subject-matter for education, and that is life in all of its manifestations,”⁷ then the development of education programs for population awareness should be high on the agenda of all of our schools.

- 6. Family Planning Association of Pakistan, *A Summary of the Family Planning Association of Pakistan National Conference 1969*, Lahore, West Pakistan: Swedish Pakistan Family Welfare Project, Communication Section, n.d.
- 7. Whitehead, Alfred North, *The Aims of Education*. New York : Mentor Books, 1949, page 18.

ISSUES AND PROBLEMS IN INTRODUCING POPULATION EDUCATION

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The curriculum of the educational system in a dynamic society is constantly changing. In some instances the changes represent more effective ways of attaining the established goals of the system. In other instances, the changes involve new educational objectives or at least new emphases within the framework of the established goals. One curriculum change of this latter type that is being considered in many countries in all regions of the world is the introduction of content which is usually referred to as "population education" or "population awareness education".

As is true for any new field of study or new emphasis, there is not full agreement on the definition of the field and the terms of reference to be used. The focus of concern is education in the formal school system concerning human population dynamics as related to both personal and general social development. Although the term "population education" does not in itself convey the full scope of this field, this is the term that will be used in the following discussion.

When a change in curriculum content is being considered by professional educators, a series of basic questions must be raised including the following :

1. Why should the new content be considered for inclusion in the school curriculum ?
2. What aspects of the full range of potential content of the new field are appropriate for a particular education system ?
3. What changes in the existing features of the education system would have to be made to establish the new program or emphasis on a sound and continuing basis ?

4. Are the expected outcomes from the changes commensurate with the investment of time, personnel and resources which would be required for successful introduction?
5. What is the series of steps which would need to be taken in order to introduce the change?
6. Are the resources and personnel needed to effect the change through the different stages of the introduction available or can they be made available?

Each of these questions will be considered with special reference to population education. Although there is a logical sequence to these questions, the answer for any one question is dependent in some measure on the answers to the other questions. For example, the steps for implementation of population education depend in part on the level at which the content is introduced and the extent of the changes in the existing content that are necessary.

Each national education system has its own distinctive history, curriculum structure, and interrelationship with national cultural values, and therefore answers to the six questions posed above can not be given on a universal basis. However, the types of issues and problems associated with each question can be identified and some of the possible answers presented.

1. Why Should Population Education be Considered ?

The first question—Why should population education be considered for inclusion in the school curriculum—has two interrelated parts :

(1) How significant is population dynamics as a matter of public concern ? and (2) How appropriate is the subject for the school system ?

A. Significance of Population

The significance of population changes for current and future economic and social development has come to be understood by government leaders and planners in all parts of the world. With the rapid decline in the death rate, particularly for the new-born and the young children, and with only limited changes if any in the birth rate, the growth of the population in developing countries is taking place at a very high rate. On result of this situation is that the aspirations of people for a better quality of life is being attained at a slow pace in spite of vigorous efforts at economic and social development.

A clear illustration of the problem can be seen in an examination of educational development. For the decade from 1955 to 1965, UNESCO reports that the number of young people throughout the world enrolled in schools increased from about 270,000,000 to over 400,000,000. This increase of approximately 50 per cent in a decade is a remarkable tribute to the imaginative and energetic work of professional educators and the public they serve. However, during that period, the increase in the population of school age (5-19) was even greater. As a result the number *not* enrolled in 1965 was greater than ten years earlier by 30,000,000. Even in South America during this period, where the number enrolled increased by 75 per cent—from 16,000,000 to 28,000,000—the number *not* enrolled was 3,500,000 greater at the end of that decade. This pattern in education has continued since 1965.

Similar patterns of development have occurred in other areas of human concern. Increases in the production of food, industrial goods, and consumer goods and services have been absorbed, to a great degree, by the increases in population.

To be sure, many factors besides population growth may play a role in influencing the rate of economic development. In addition, the manner in which goods and services are shared by the various sectors of a nation is a function of the social structure of a society and is not basically a population problem. However, it is clear that the aspirations of large sectors of the population of any particular country for a better quality of life can not be attained until significant per capita gains are made. Therefore any factor which seriously prevents or delays such gains is a matter of public concern. Rapid population growth is generally recognized as a factor in delaying or preventing the per capita gains necessary to raise living standards. Over 30 developing nations which encompass approximately two-thirds of the people of the world have official government programs or are sanctioning other efforts designed to effect reduction in the rate of growth. In addition, in a number of countries, especially those in Europe and North America, where birth and death rates have been in closer balance, concern has developed about population in relationship to environmental factors.

In summary, the great importance of population changes for the immediate and long range future of mankind of being increasingly recognized by scholars, public officials and informed citizens in countries in all regions of the world. Any subject of such great public significance cannot be ignored by professional educators.

The early optimism of many working on population problems concerning the possibility of meeting these problems with new action programme in a relatively short period of time has given way to the realization that sustained effort over a long period of time will be necessary. In addition, the number of potential conceptors expands each year as new cohorts of young people reach the age of reproduction. The development of educational programs for young people is now being given serious consideration in many countries as one of the long-range steps.

B. Appropriateness for School Curriculum

The fact that population changes or any other problem is of great social significance does not necessarily mean that educators will agree that it should receive major attention in the school system. Several factors must be considered: (1) What is the level of knowledge about the problem? ; (2) What is the culturally accepted role of the education system in reference to matters of personal or social concern ? ; and (3) Can the content be presented in such a fashion as to be understood by school-age young people ? Each of these problems merits some attention.

Level of Knowledge : The knowledge base for the various subject areas in the school curriculum is not a fixed or stable unit. Significant increments in all areas of study are made with great frequency. The potential content of population education involves both the social sciences and the life sciences and both of these general areas are particularly dynamic at this stage of intellectual development.

There is a large body of knowledge in the field of population on which a responsible curriculum can be built although the depth of the scholarship on particular problems in individual countries varies considerably. The UN and other agencies operating on an international basis have been rapidly facilitating the extension and availability of knowledge in the field. Research and training centers in population were established by the UN a number of years ago in Santiago, Chile, in Bombay, and in Cairo ; recently the UN opened regional population offices to facilitate further attention to this field. Population institutes of various types have been established by public or private group in most Latin American countries as well as in many other countries during the past decade. The work of those groups and of other scholars has provided an

adequate knowledge base for the development of a responsible curriculum.

Culturally Accepted Role of Education : The extent to which the educational systems give attention to problems of social significance is essentially a function of national education philosophy and orientation. In most settings, the curriculum is organized around generally accepted academic disciplines such as history, mathematics, and biology. In some countries, the basic personal and social problems serve as an organizing base. From time to time, efforts are made to establish a system in which the interests of the individual learner are paramount so that the school system has no curriculum.

In practice, education systems are usually characterized by a mix of these three approaches with the traditional academic subject fields serving as the central feature. Even in those settings in which a strong emphasis is given to traditional fields, attention is frequently given to personal and social concerns through appropriate selection of the content within the subject area and through methods of teaching which relate the content to current concerns.

The field of population education can be adapted to any of these three philosophies. For example, the relevant content can be incorporated within the academic subjects of the social and life sciences and can serve as one of the foci of attention for relating such subject matter to issues of personal and social concern.

Suitability for Schools : The appropriateness of the content of population education for those of school age should not be considered as a serious problem. It is true that at the present time in many countries systematic study of population dynamics and related matters is largely limited to higher education in fields such as economics, sociology, geography, biology and other life sciences. However, this does not preclude its introduction at the elementary and secondary levels since curriculum specialists frequently draw on bodies of knowledge which are taught in a more comprehensive and complex manner at the higher education level. For population educators the problem is not that of the inherent complexity of the subject matter but rather one of creatively selecting the salient concepts and organizing the approach in a fashion to insure that the young learner sees the significance for himself as a person and as a future citizen.

As the discussion above demonstrates, the answer to the first question is that the problem of population change is one of great

significance and is appropriate for inclusion in the school curriculum. This can be achieved whether the curriculum is organized around traditional fields of study or current problems.

2. Possible Content of Population Education

The second basic question for the curricular innovators follows from the first question : What specific aspects of the proposed new subject area are most appropriate for the school system ?

The solution to this question must be worked out by educational specialists for their own educational systems. However, the following elements need to be considered for any new curriculum : (1) The nature of the learner, (2) the distinctive features of the body of knowledge from which the content is to be drawn, (3) the specific outcomes which are desired from the innovation, (4) the qualities possessed by the instructional staff, and (5) the constraints posed by the structural aspects of the school system and its program. Some brief comments on these elements will illustrate their usefulness for the curriculum specialist concerned about the introduction of population education.

The Nature of the Learner : A basic point of departure is that the learner is a member of the population and will expect to be a parent someday. He brings to the school a set of attitudes and values concerning such areas as age at marriage, size of his own future family, whether it can be planned, what he thinks of as a large or small family, and perhaps whether unlimited growth of his community and nation is a positive or negative value. His attitudes in some of these areas have a strong affective quality. Systematic research on these problems would of course be of great value in relating the content to the learner.

Characteristics of the Relevant Bodies of Knowledge : The various subject areas in the school curriculum differ in the nature of the content involved. Some content areas are highly developed and some are less well developed. Some are relatively abstract and rely a great deal on symbols and others are much more concrete.

A. Social Science : One of the primary knowledge bases for population education is in the social sciences, and the problems for the social science educator in developing population education are not qualitatively different from those which he faced in building the existing curriculum. In areas such as sociology, economics, political science, anthropology, there is less common agreement among scholars on a large set of basic propositions than in the physical sciences.

In addition, personal values play an important role. This may account in part for the fact that social science disciplines are taught less frequently at the school level.

In demogrphy, a relatively large body of empirical data has been developed and organized on a systematic basis. At many points, population factors are basic elements in the content of other social sciences.

B. Mathematics : The basic unit in population analysis is a discrete unit—a person—and mathematical manipulation of these units is a prominent characteristic of population study. Because of this factor, population data are suitable for inclusion in instructional exercises in mathematics. The highly sequential character of instruction in mathematics provides a setting in which increasingly complicated mathematics content can be presented through use of population data.

C. Biology and other life sciences : Biology and related sciences have been moving away from a taxonomic approach in recent years and new ways of organizing the content have been developed. In these new approaches, the problems of human populations have received attention, particularly in relation to animal and plant populations. Human reproduction has been systematically excluded from many school texts in the past but this practice is changing and many new textbooks include this aspect of population education.

D. Ecology : The study of man's relationship to his natural environment is increasingly being recognized—particularly in parts of the world where extensive alteration in the natural environment has taken place—as suitable materials for courses in the life sciences. Population education can be presented as a significant area of ecological study.

E. Family life and sex education : These areas of study have been introduced into the curriculum of schools in some countries. They are usually presented with a problem focus rather than organized around traditional fields of study. In some circumstances, there may be a good basis for infusing population education into these subject areas if they are a part of the present system.

The Goals of Population Education : The desired outcomes of any innovation are of course a central factor in the selection of the appropriate content. The information, skills, and attitudes to be developed through population education are of two types. On the one hand, the program should develop an appreciation by the individual

of the consequences for his family and society of his own actions and attitudes, and on the other hand it should develop an appreciation of the consequences for the individual of the population changes that are occurring in his community and nation. The individual is both an actor and the recipient of the actions of others.

As a means of identifying the potential areas in which population education might be useful for the individual, some of the actions or decisions of individuals with population consequences are listed. Over the life time of an individual the following aspects of his personal life contribute to the population dynamics of his society. The age at which he marries, the length of time between marriage and the birth of the first child, the age of which each pregnancy occurs (spacing), the total number of children born in or out of wedlock, the extent to which the individual has been successful in avoiding the loss of any children through death, and inculcation of attitudes in his children concerning factors of the type listed above. In addition to the individual's behavior within the family, other actions may be taken which are expressions of his role as a citizen. In this category are his responses to community or national proposals for dealing with population issues.

Each of the events or actions listed above occurs as the result of the interplay of many personal and social factors and it is not assumed that population education would necessarily focus on all of these factors. However, the goal of population education is to make the student sufficiently informed so that his actions in these areas would be taken with full awareness of their consequences.

A second type of goal grows out of the individual's need to understand the ways in which he and his family and his nation are influenced by population dynamics. Through population education he can be made aware of the impact of such factors as the growth rate, the age structure, and migration patterns on economic and social development. On a more personal basis he should appreciate the impact of such factors on the access to employment, social service, and amenities for him and his family. He should understand the reasons for migration of rural residents to the cities and the difficulties involved in absorbing the migrants into the institutional life of the cities.

These are a few of the ways in which the individual's life is influenced by the population dynamics of his country. Population education has as its goals the development of an appreciation of

these influences as well as basic understanding that will guide him in his own actions that have population consequences. The translation of goals of this type into specific instructional programs appropriate for students of different levels of maturity is a major task of the curriculum specialists.

The Characteristics of the Instructional Staff : Another factor to be considered in selecting the appropriate content for the school system is the instructional staff. The problem here is two-fold : To what extent do teachers have the necessary understanding of the content of population education and to what degree are teachers able to handle content professionally in an area in which their own values and circumstances may be involved ?

Since population education is essentially a new content area for schools, the current instructional staff has probably not had professional preparation for this area. As in any new area, adjustments in the pre-service and in-service education of teachers is the usual means for meeting such a need. In this instance the infusion of population education content into various subjects in the different levels of other education systems makes the preparation of staff a complicated task.

The instructional problem is further complicated by the potential difficulties faced by teachers whose own values concerning population and reproduction may influence their interest in and their capacity to function professionally in this area. This is not a new problem in education and can be met in part through careful training of teachers and provision of instructional aids.

Structure of the Education System : The final element to be considered in developing the content of an innovation such as population education is the structure of the school system and its program. Decisions concerning the content of population education should take into account such factors as the retention rate of students at different levels, the degree of division of labor among the instructional staff, the extent of reliance by teachers on externally prepared instructional materials, the degree of local or central control of the curriculum, and the nature of external examination systems.

3. Educational Changes Involved in Introducing Population Education

The third basic question may now be considered : What changes in the existing features of the education system would have to be made to establish the new program or emphasis on a sound and continuing basis ?

As in the consideration of the second question, the answer to his question will vary from country to country, and the answer can best be determined by the professional educators in each country. Two basic propositions underlie this question. (1) Most innovations, including population education, are modification of existing patterns rather than complete changes in the system or something totally new which is being added to a system. (2) The effect that modification in one part of a system has on other parts must be taken into account if the change is to become a permanent part of the system.

Since most school curricula contain some content of relevance for population education, a careful examination of the current syllabi and textbooks in an important first step. The present content can be matched with the desired changes and the extent of the changes necessary can be determined.

Although for many curriculum innovations, models are available which may be adapted to local circumstances, for population education no models have been as yet, fully developed and implemented. Furthermore, most of the planning for population education which is now taking place is based on the assumption that a process of infusion of content into appropriate places in the existing program of study is the best approach to be used. For that reason, those programs which are being introduced in one setting may not be directly useful to another education system.

Once the appropriate content of population education has been determined, measures must be taken to insure that it has a continuing place in the system. The nature of the actions taken depend in large part on the special features of that structure. Some of the actions typically necessary are the following : (1) Appropriate modification in the preservice training of teachers, (2) in-service education of those who are already teaching, (3) work with headmasters, supervisors, and inspectors to insure implementation of the new program and to provide guides for teachers, (4) inclusion of population education questions in external examinations, and (5) establishment of effective means for feed-back from teachers to facilitate the identification of field problems and to identify creative approaches developed in the field. The mechanisms for instituting these types of actions on a coordinated basis are already present in many ministries of education.

The assessment of the degree of changes in introducing population education will therefore involve attention to both the content of

the curriculum and to the supplementary and reenforcing changes in other parts of the education system.

4. Weighing of Positive and Negative Aspects of Change

Following the consideration of factors involved in the development and introduction of population education, the fourth question can now be posed : Are the expected outcomes commensurate with the investment of time, personnel, and resources that will be required :

The answer to this question has to be based on the critical judgment of experienced professional leaders in each setting. Since population education is a new field, there is only a limited body of experience to which one can refer. Given the time interval between the school years and the time when the consequences of the education can be meaningfully determined, and in view of the variety of factors that may intervene during that period, adequate assessment will be difficult to make. However, this difficulty is not unique to population education. Professional educators are frequently called upon to weigh the positive and negative aspects of existing programs and new proposals, and this experience can be brought to bear in making this assessment concerning population education.

5. Strategies in Introducing Population Education

Assuming that the decision has been made to introduce population education, the next question to be considered is: What steps need to be taken in order to introduce the change ?

The strategy involved in effecting a change in the curriculum is a function of both the content of the innovation, and the general structure of the education system. For population education, the content poses several problems. This is a new field; it is potentially controversial; trained leadership for this field may not be available; and it is more complicated to infuse content at various places in the curriculum than to introduce discrete self-contained courses.

The general structure of the individual education system is a factor in the determination of the strategies which may be used. For example, the approach used in a highly centralized national system of education will of necessity be different from the strategies involved when control of education is largely at the local level. Similarly, some national systems have an effective research, development, and in-service education mechanisms which can be used to develop and introduce population education. Other structural features

that will influence the selection of strategies include: (1) the degree of stability of the system, (2) the degree of politicalization, (3) the commitment of the leadership to innovation, and (4) the general moral of the teaching profession.

Although the sequence and timing will have to be determined in the light of local circumstances and resources, the following specific actions should be considered: (1) Background research: An assessment should be made of scholarly work available concerning the knowledge of and the attitudes toward population and related areas of teachers and students. New research may be required to fill in the major gaps in the state of knowledge.

(2) Survey of existing curriculum and syllabi: A careful review of what is now being taught should be made. This should include attention to both explicit content and to implied value.

(3) Identification of general curriculum reform efforts: If curriculum reform projects are already underway in content areas of the curriculum in which population education might be incorporated, it is important to explore the advantages to be gained in becoming a part of such projects. This is of particular importance if the decision is made to introduce population education by infusion of content in regular courses of study rather than as a self-contained course.

(4) Pilot projects: The use of a pilot project to perfect a new approach before introducing it on a national basis has been a widely accepted practice. This is particularly appropriate for self-contained instructional units since the evaluation process is relatively easier in such circumstances. As noted above, an infusion approach to population education seems to be more appropriate and therefore special adaptation of the pilot project method may be required.

For higher education and for teacher preparation, new courses or extended units in existing courses may be a more efficient approach. In such settings, pilot projects may be an appropriate means for developing and testing instructional materials and methods.

(5) Building public and professional support: Introducing population education is in one sense a technical problem in which such issues as the selection of appropriate materials and the integration of such materials into the curriculum are involved. However, such a change is also a political process. Education leaders and teachers must be convinced that the proposed changes are desirable and feasible. It may also be true that some sectors of the general pub-

lic will oppose the change unless steps are taken to gain their acceptance and support so a careful assessment of the potential resistance should be made. The steps to take as a result of this assessment depends on the local circumstances. In general, it seems likely that the public will be skeptical of the change if the educational leaders have serious reservation. On the other hand, the building of public support or at least support by influential public leaders may be necessary in some situations to overcome the reluctance of educators to make a change.

The involvement of the professional education organizations may be helpful, not only in building support for changes but also in assisting in the development of the substantive aspects of the change. For example, in India, the national organization of teachers and the organization of teacher educators have discussed population education in their annual meetings and have sponsored workshops to aid in the development of instructional materials.

(6) Training of professional leadership: Since population education is a new educational field, the availability of professional personnel competent to provide leadership may be a problem. Although consultants may be able to assist in developing the program, leadership from within the national education system is essential. Specialized training for potential leaders who want to assume responsibility for the new area may be necessary. In general, it is probably better to select personnel who are familiar with and committed to the formal education system and provide them with the necessary supplementary training rather than to select individuals who have background in the substantive field of population but are not experienced in education planning and administration.

The special training referred to need not be thought of only in terms of a formal degree program in a local or foreign university. Concentrated work for three to six months should be enough time for an experienced educator to develop a high enough level of competence to provide leadership in developing this new field. Visits to a few international centers would facilitate this training process but are not absolutely essential. With this background, further development of competence can be attained after assuming a working position in the Ministry of Education or in another appropriate setting.

(7) Development of a basic reference book : Since much of the scholarly research and writing in the field of population is geared to the specialist, the source materials needed for general education

purposes are limited. A basic reference book written for the secondary school level or for use of teachers who are not specialists would be a valuable asset. Such a document would also be very useful for the textbook writer preparing materials for the school level.

A reference book of this type would serve as a means of insuring that the factual materials included in the instructional program are accurate. Since the effort is an educational one, distortions growing out of bias or ignorance should be guarded against. In the absence of a reliable reference book, there is greater danger that such distortions will occur.

(8) Collaboration with other public and private organizations: During the past few years, groups and agencies have been organized in many countries with programs and interests that are in varying degrees related to the field of population education. In countries where official family planning programs have been established, the staffs of such programs can be a valuable resource. The factors that lead the government to establish a family planning program are important data for the content of a population education program.

In many countries, institutes have been established for the scientific study of population and such organizations may be a useful source of materials and of consultants. Similarly, groups working in the area of family life education or sex education may also be of assistance. The reputation and the reliability of such groups would of course need to be carefully assessed.

The eight specific actions identified above have been considered as discrete units. The development of a general strategy for introducing population education requires that decisions be made concerning the types of actions to be taken and the sequence and timing of such actions. At least three general strategies may be identified.

One of these may be referred to as the incremental pattern. Under this pattern, a program is introduced at a few selected places and then the program is gradually extended to more and more places. Over a period of time all educational units eventually incorporate the program into their curriculum.

A second strategy—a system-wide approach—has as its central feature the simultaneous introduction of population education throughout the education system after the necessary preliminary work has been done.

A third strategy can be considered as the sequential approach. Under this approach, the focus of attention is initially on one level

in the education system and over a period of time the program is introduced in sequence up or down the academic ladder. For example, population education might be first introduced at the college level and in teacher education programs or the point of initial entry could be the elementary level. This latter pattern might be particularly appropriate in educational systems in which the attrition rate is very high in the lower levels of the academic ladder. Although these three strategies have been presented as distinct and simple models, in practice, some combination of the three is more likely to occur.

Regardless of the particular strategy for implementation that is adopted, certain basic steps would have to be taken. A curriculum design and appropriate instructional materials would have to be prepared, official sanction for the program would have to be secured, teachers would have to be trained, administration support would have to be provided, and some type of evaluation system would have to be instituted.

6. Availability of Resources

The sixth and final question to be considered is : Are the resources needed to effect the introduction of population education available or can they be made available ? The basic information necessary for the consideration of this question would have been assembled in large measure in the process of examining the other questions. The resources needed would depend in part on the scope of the program planned and the strategy of implementation.

However, the basic issue is the level of priority that can be given to population education. At any point in time, educational leaders are faced with the necessity of allocating scarce resources among many different programs and activities. For example, funds may be used to hire more teachers or to raise the pay level of those already employed rather than to make desirable curriculum reforms. Such decisions are difficult to make but some system of priorities must be established.

For those interested in establishing a population education program, the task is to insure that the potential contributions of this program are fully understood, by those who have to make the decisions. In addition a careful assessment of the resources needed to introduce the program will aid the decision makers in determining the level of priority that will be given to population education.

Conclusion

The problems and issues involved in the introduction of population education have been organized under the six basic questions posed at the beginning. Wherever possible, answers have been given which would be generally applicable but for most aspects of the questions, answers will vary with the individual circumstances. At these points, factors to be considered in arriving at the answers for a particular education system have been identified. The presentation should be considered as a guide rather than as a set of final answers. As the body of experience in population education increases, more definitive answers will begin to emerge.

CURRICULUM DEVELOPMENT FOR POPULATION EDUCATION*

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Perhaps the most fundamental problem facing mankind is that of population growth; and this problem is very near to the countries of South-east Asia. Since the countries of Asia contain well over half the world's total population growing at an even more rapid pace than the world average the core of population problem lies primarily in Asia.¹ The fact becomes even more significant in the context of the uphill task of economic reconstruction in which most of the countries of the region are engaged presently. The risks to this improvement of 'quality of life' involved in the problems arising out of growth of population are of such magnitude that even the slightest delay makes them more complicated and difficult to be handled successfully.

The reasons are not far to seek. Almost half of the population of the countries of this region is below 16 years of age. A young population requires a particular kind of expenditure to support it. There are new demands for more schools, more health facilities, more transport and housing facilities and more job opportunities. A proportionately large outlay is required to meet these rising needs and consequently the economy in a developing country is thus put to additional pressures by the ever growing numbers. Because of this 'deep bite' which population growth takes out of any increase in a country's national income, it becomes well nigh impossible to provide better civic services and amenities, which go to improve the quality of life.

* Paper presented at the National Seminar on Population Awareness Education, Colombo, Ceylon, March 24-27, 1972.

1. Report of Asian Regional Workshop on Population and Family Education—UNESCO Regional Office for Education in Asia, Bangkok 1971. p. 11.

To add to these are the problems created by the consequent rush to the cities (a result of both industrialization and population growth). These swelling numbers have created environmental problems, such as pollution of water and air as well. Unemployment and social tensions have increased considerably and with them crime, violence and other anti-social activities. In recent years though the countries of this region have taken remarkable strides in expanding education and the percentage of literacy has gone up in several of them the absolute number of illiterates aged 15 and above is actually higher than what it was ten years ago; and there are more children between 5 years and 15 years out of school today than what they were ten years back. It looks like a paradox but it is true and with this growth rate the prospects for the future are bleak.

"Even with the best intension and consummate planning, it may not be possible to solve the problems of expansion of education, unemployment, poverty, shortages, inadequacy of civic amenities and a host of others unless these problems are tackled in the context of the total population problem of the country. This could be done only if the plan of raising resources are complemented by measures of reducing population growth by lowering the birth rate".

It is very heartening that several countries of this region have taken up extensive family planning programmes but these programmes aimed at those already in the reproductive age group, can at best, solve only a part of the problem. No doubt more vital problem is that of the approximately 45% of the young people who will constitute the adult population in the coming three decades. It is their reproductive behaviour when they come of age, which is going to affect considerably the population situation in future. Urgently important, therefore, is the cultivation of a desire amongst this group of youngsters to adopt family planning as a way of life. It is this desire and the competence to make decision on a national basis which is the essence of 'responsible parenthood' and with that goes 'responsible fertility behaviour'.

The need to catch them young is thus obvious and it is here that Population Education becomes relevant as an important instrument of change and of developing desirable attitudes that would lead to sound decision making by the individuals who are responsible for and productive of both individual and social good.

• Mehta, T.S., Population Education in School Curriculum, Working Document for Bangkok-UNESCO Seminar, Oct. 1970.

The analysis made so far may be summed up in the form of a few assumptions to draw up a programme of population education :

- i) The increased population growth is responsible for retarding economic progress of the country and is adversely affecting the health and well-being of the younger generation.
- ii) Population is not only a quantitative phenomenon. "It is the quality of population that is most relevant both as a factor of growth and as an end product of growth."
- iii) In order to effect any change in the growth rate of population future parents form the most important segment of society whose changed attitude towards the family size is vital.
- iv) Population Education through the school system could be a potent instrument of developing these attitudes and competencies to take rational decisions.
- v) The roles of population education and family planning programmes are complementary and not identical hence population education need not be equated with sex education or knowledge of family planning methods.
- vi) The school population education programme should be a part of a comprehensive approach and not hang in isolation.
- vii) The curriculum of population education may differ from place to place, culture to culture and according to the stage of development of a particular country. It needs to be in tune with the overall national goals of education in order to become an integral part of the total school programme.

These assumptions do as well serve as a set of criteria for developing curriculum in Population Education.

Development of a Curriculum in Population Education

(Note :—In this paper the discussion is confined to the development of curriculum in Population Education at the school stage and therefore the other large groups viz. university students, out of school youth and teachers are not taken up.)

It is through curriculum that education seeks to achieve the ultimate goal which is to help the students to achieve self-direction

and learn to contribute to the betterment of human life. Hence the first need is to develop a well-defined curriculum of population education, with a well-conceived sequence of activities and experiences suited to the conditions of Ceylon.

Curriculum development is a complex task in which several processes are involved. The basic questions the answers to which shall have to be sought by educators while developing curriculum are as follows :—

- (a) What educational purposes should the school seek to attain through the introduction of population education as an integral part of the school programme ? (What are the objectives of population education at the school stage ?).
- (b) What educational experiences can be provided that are likely to attain these objectives ? (What should constitute population education ?).
- (c) How can these experiences be effectively organized ? (Whether they are to be integrated or separately organized ?).
- (d) What should be the strategy of implementation of this change ?

Formulation of Objectives

Explicit goals are necessary to guide learning because unguided educational experiences may produce a wide variety of efforts some desirable and others not so desirable. Education is concerned with bringing about certain changes in the ways the educands behave. The identification of the kinds of changes to be brought about in pupils, is the process by which these goals are formulated.

There are two important steps involved in the formulation of objectives of population education. The first is a critical study of the curricula operative at present in the Ceylonese schools. This will mean analysing the existing syllabi in Social Studies, Geography, Economics, Health Education, Political Science (Civics), General Science, Biology and Languages etc. This study will provide a background and the inherent objectives of the school programmes and also some idea on what could be done within the existing framework of the curricula in schools.

The second step would be the clarification of the concept of population education and develop a point of view suited to the needs

of the country and in tune with the prevailing school programme. On the one hand each country is facing population problem in a somewhat different form, on the other hand each educational system has its own specific goals based on national educational policy. Moreover every society is sustained by a core of values that lies at the heart of its way of life. These values of a culture lend tone and spirit to the total educational process and allied activities. Therefore in order to clarify the concept of population education and to identify clear cut objectives of teaching it at the school stage what needs to be done is a careful review of the broad canvas of the contemporary society in Ceylon, its socio-economic needs, the pull of tradition and the forces of changes, the influence of science and technology on the life of people, the aspirations of the people and the direction that is being taken for its planned growth. It would be worthwhile to consult all the available literature and the attempts made by other societies. This review should result in the identification of some major objective for population education, on which a consensus may emerge after discussions at various levels. This concept should be uniquely Ceylonese and best suited for its needs. However, it would not be out of place to mention here some definitions of Population Education as they emerged in some other South-east Asian countries through this process.

India

"The objective of population education should be to enable the students to understand that the family size, is controllable, that population limitations can facilitate the development of the higher quality of life in the nation and that a small family size can contribute materially to the quality of living for the individual family."

Students at all levels have a right to accurate information about the effect of changes in family size and in national population on the individual, the family and the nation so that this body of knowledge is utilized to control family size and national population with beneficial impact on the economic development of the nation and the welfare of the individual families.³

Malaysia

The goals of population education are, on the macro level to impart to the students knowledge and information concerning population characteristics and the cause and consequences of population

3. Report of National Seminar on Population Education, Bombay, 1969, Eds. Mehta, Parakh, Saxena, NCERT, New Delhi. p. 9.

change so that they will better understand the effects of these characteristics and processes on a wide range of public policies. Also, they might gain an understanding of the effect of public policy on population issues. Thus the goal is to create an informed citizenry capable of making responsible decisions with regard to population policy matters. On the micro level, the goal of population education is to develop responsible fertility behaviour as might be defined by the norms and the needs of the society.⁴

UNESCO-Seminar Bangkok

Population education is an educational programme which provides for a study of the population situation in the family, community, nation and world, with the purpose of developing in the students rational and responsible attitudes and behaviour toward that situation.⁵

Korea

Population education seeks :—

to familiarize teachers and students with factual knowledge of population dynamics so that they will understand the causes of population growth and its personal and social impact;

to provide teachers and students opportunities to consider together a number of attitudes towards population problems and their causes so that they will be able to measure their own outlooks.⁶

Thailand

The objective of population education is to give the learner an insight into the totality of issues connected with population, ranging from the nature, measurement, causes, determinants and consequences of population growth as well as of urbanization both at the micro level of the family and the macro level of the community, the nation, or world at large to the dynamics of the reproductive process and finally to the possibilities of planning family size and population growth.⁷

4. Report of National Workshop on Population Education, Ministry of Education, Kuala Lumpur, Malaysia Oct. 1971.
5. Report of Asian Regional Workshop on Population and Family Education, UNESCO Regional Office for Education in Asia, Bangkok 1971.
6. Report of Project in Curriculum Improvement for Population Education in Elementary and Secondary Schools of the Republic of Korea, Central Education Research Institute, Seoul Korea 1971.
7. Keynote address delivered at the Workshop on Population Education Bangkok Dec. 1971 Prof. J.E. Jaysuria (Memio).

Even at a cursory glance of these statements defining the objectives of population, is discernible a remarkable similarity of purpose. In a recent paper Dr. Wayland has summarized it thus: "Population Education is an essentially new curriculum area which as emerged in the past six years and is used as a phrase to refer to all the various educational activities in the formal school system dealing directly or indirectly with population issues. The basic purpose of the activities is to aid young people in schools to understand the potential significance of population factors for their own lives and for the family, nation and for the world in general and to develop values and attitudes based on this understanding.⁸

Selection of Content : (What Constitutes Population Education ?)

The next step in the process of curriculum development is the selection of suitable educational experiences that are likely to attain the objectives thus set forth.

This means, identification of concepts, information and facts relevant to population problems, population dynamics and its effects on the life of the people of Ceylon in particular and the world in general.

Because of the very nature of objectives laid down for population education it must draw for its content, upon the relevant concepts from academic disciplines Demography, Economics, Civics, Geography, Sociology, Ecology, Biology, Health Education etc. The approach therefore is of necessity, interdisciplinary. The curriculum specialists who would be responsible for developing the school programme shall have to work closely with various specialists in demography, behavioural sciences, biological sciences and also specialists working in the area of family planning. Core concepts relevant to population education thus chosen (on the basis of the criteria laid down earlier in the form of objectives) would form an outline of the course content to be incorporated in the total school programme. For incorporation it would be necessary that the course is properly articulated and properly graded according to the suitability of concepts and information for different levels of school education. The status study previously done will come handy in this process.

No perfect model of population education exists at present which could be adopted by any country, and perhaps it is also not

8. The Development of a Population Education Programme in Thailand—Dr. S.R. Wayland Oct. 1971 (Memio).

very desirable to do so. The selection of content, therefore, would be specific for a country and unique to a degree. However, attention may be fruitfully given to the approaches used in other countries, particularly those in the Asian region with several common traditions and values.

India

On the basis of the overall objectives laid down, the following six major areas have been identified which are not exclusive to particular disciplines but draw from several social sciences and biological sciences. They also have a wide scope for encompassing most of the concepts related to population education at the school stage. These areas are :—

- i) The population growth (determinants and demographic situation).
- ii) Economic development and population growth—(Consequences).
- iii) Social development and population growth (Consequences).
- iv) Health, Nutrition and Population.
- v) Biological factors—family life and population.
- vi) Population programmes—national and international.⁹

Malaysia

- i) Basic demographic concepts, processes and methodologies.
- ii) Static description of the population situation at the micro and macro levels.
- iii) The determinants of population growth.
- iv) The consequences of population growth.
- v) Human reproductive process as a basis for understanding human fertility.
- vi) The national and international population policies and programmes.¹⁰

Korea

- i) *Significance of Population Problems*
 - (a) Meaning (b) Origin (c) Importance

9. Population Education—A draft Syllabus—Mehta, Saxena, Chandra, NCERT, New Delhi, 1971.
10. Report of National Workshop on Population Education, Kuala Lumpur, Malaysia—Oct. 1971.

- ii) *Population Phenomenon*
 - (a) Static population data (b) Population changes.
- iii) *Problems of Over Population*
 - (a) Home problems (b) Economic problems (c) Social problems (d) Educational problems.
- iv) *Solution of Population problems*
 - (a) Family planning (b) Movement abroad (c) Economic development (d) Social systems.
- v) *Factors impeding the solution of population problems*
 - (a) Son preference (b) Anxiety about high mortality (c) Traditional values favouring high fertility.¹¹

Thailand

Recently in his keynote address delivered at the Workshop on Population Education Bangkok—for Thailand (Nov. 29—Dec. 3, 1971) Prof. J.E. Jaysuria suggested the following five broad areas within which the content appears to fall :—

- A. Collection and analyses of population data :
 - demographic processes
 - growth rates, age structures and their consequences
 - determinants of population growth
 - trends of population growth etc.
- B. Population growth and human development :
 - at the micro level of the family
 - at the macro level of the nation.
- C. The problems of urbanization :
 - Housing, transportation, unemployment, social tensions etc.
- D. Family Life Education :
 - Family its role
 - Psychological aspects of human sexuality
 - The reproductive process.
- E. Planning to cope with the problems of urbanization and population growth.

11. Report of Project in Curriculum Improvements for Population Education—Central Education Research Institute, Seoul Korea—1971.

An issue that has caused a lot of discussion in some of the countries of this region is whether sex education forms or does not form a part of population education. Though there is an area of overlap, the goals as spelt out for population education and sex education differ considerably hence it is not necessary to insist on introducing all the aspects of sex education as it is understood in the West. This area of common elements differs from culture to culture according to the degree of the acceptance of the components of sex education. Although an understanding of some parts of sex education would give a more complete picture to population education it would be perhaps expedient to avoid it and not invite resistance from a significant sector of society.

To sum up,—by and large—the accepted major elements of population education are :—

- (i) Determinants of population growth
- (ii) Demography (Population situation—static and dynamic)
- (iii) Consequences of population growth
- (iv) Human reproduction
- (v) Family planning policies and programmes
(Both IV and V are usually regarded to be the integral part of sex education).

Preparation of Instructional Materials

The next sequential step in the process of curriculum development would be the preparation of instructional materials for the use of teachers and students. It may take the shape of textbooks, handbooks for teachers, supplementary reading materials, audio-visual aids-charts films etc. On the availability of good material depends the success of the programme. It is not easy to prepare instructional materials because it involves the translation of difficult concepts and present them in the form suited to the maturity level of the students at different stages. It would, therefore, be necessary to involve knowledgeable persons from the various fields and with varying competencies. The panels formed to prepare this material may include teachers, subject specialists from relevant fields (Demography, Sociology, Geography, Economics, Civics, Biology etc.) method specialists, artists, audio-visual experts and also educational administrators. In the interest of the programme, it may be good for a small country like Ceylon to draw up at the national level plans for the production and diffusion of instructional materials.

To the extent possible try-out of the material may also be undertaken so that the feed-back may be utilized for improving it. The teachers involved in the preparation may also take up 'Field testing of the materials before it is given the final shape.

Incorporation of Population Education in School Curriculum

The question, how to incorporate population education in the school programme, is still an open one though several national and international seminars have favoured the fusion of population education concept through the entire school programme, wherever they are educationally relevant and appropriate.

Arguments given in favour of this approach are :—

- (i) the curriculum is already overcrowded
- (ii) the demands of traditional subjects are increasing due to the explosion of new knowledge
- (iii) children will probably learn better if they are confronted with relevant population materials both through out their entire period of schooling.¹²

If this approach is adopted it would be necessary to conduct status study of the existing curricula of schools in Ceylon and find out 'plug points' appropriate for injecting population education into courses in Social Studies, Geography, Economics, Civics, Biology and Languages etc.

However there exists another view point also, supported by equally weighty arguments, which favours providing a special course in population education. The protagonists of this view contend (perhaps rightly) that if the imparting of population education is so crucial to the welfare of the humanity why can't it be given the status of a 'compulsory separate subject' with all its ramifications and the school programme modified to make room for it. It may perhaps be more economical to do it that way "for such a course would require relatively a small number of resource persons as compared to the programme for infusion or injection again, from the point of view of time base involved, both the preparation of material and teaching may take up less than what would be required if the strategy were injection."¹³ There is another risk

12. Vederman Stephen 'Developing Population Awareness in the Developing World', Paper read at the National Science Teachers Association Annual Meeting 1970 (Memio).

13. Jaysuria, J.E., *Ibid.*

in the fusion plan of the concepts, plugged into various subjects becoming discursive, diluted and may lose needed articulation. Therefore, a better alternative may be a compromise between the two approaches viz. population education concepts may be plugged into the existing curricula wherever possible and a core short term compulsory course for all students may be developed and added to the existing curricula. There can be no finality about the approach and the decision about it shall have to be taken by the countries according to the facilities available.

Teacher Orientation

Though teacher preparation does not strictly fall within the scope of this paper it would not be out of place to mention that the teacher is pivotal in the implementation of any scheme of educational change. His conviction and orientation to the new curriculum are absolutely necessary, hence both in-service and pre-service programmes for this purpose need to be simultaneously developed and taken up.

To say anything with finality about population education would be presumptuous and premature. We have to tread a new ground and many things about the concept, curriculum, teacher preparation and implementation strategies would become more clear as the programme moves ahead. We should be prepared to make necessary changes in the direction of the programme, whenever necessary, hence an inbuilt flexibility is the prerequisite for any national plan of action. Perhaps the only thing that could be said with finality is that the introduction of population education brooks of no delay for even the shortest delay may be 'too late'.

THE ROLE OF VOLUNTARY AGENCIES IN POPULATION EDUCATION

SMT. AVABAI B. WADIA

President, Family Planning Association of India

It might well be questioned that when the education authorities are handling the promotion of population education through infusing population material into the curriculum, what is the role that voluntary agencies—and voluntary agencies engaged in family planning work at that—can usefully play. It may be said that while there was a role for such agencies in bringing the subject to the notice of education ministries and school and college principals and teachers—a role that the Family Planning Association of India for instance, has vigorously pursued—once that has been accomplished, the matter passes out of the scope of such agencies. Personally, I do not think so and I can visualise at least four major sectors in which we can continue to try to make worthwhile contributions. These are as follows :

(1) Continuing to develop and refine the objectives, 'scope and content of population education at various levels. Not even the outlines of this new branch of contemporary knowledge have been crystallised as yet, and much more thought and work are needed in this direction before population education programmes can begin to fulfil their underlying purposes.

While some think of population education in terms of diluted demography and others identify it with the older stereotypes of family life education, a total concept of population education needs to relate to the individual, the family, the nation and the world, before it can become an educational approach to an understanding of the complexities of population dynamics. Experts from the field of education and of population have to work together to make this a full-bodied concept, fit to receive a proper place in the training of the young.

(2) The stimulation and orientation of various concerned agencies is another major task that voluntary agencies can under-

take. Starting, on the one hand, with Ministries of Education and educational administrators, and including all types of educators and teachers, it is most important to present them with the relevant facts and convince them of the importance of population education as a part of their teaching experience. Over-crowded syllabi are becoming the bane of modern education, partly due to the clinging to old and out-moded bits of knowledge and ways of teaching and, to a considerable extent, due to the "explosion of knowledge" which is taking place where new discoveries are emerging at breathtaking speed. For instance, we find that even parents with good university degrees are unable to help their children at home in science and maths taught at good schools, due to the recent advances in these subjects. Therefore population education, to find a place in the curriculum, has to show a very good case. It does have that case, by the very fact that it is so closely linked with the other modern "explosion", of rapid growth in human numbers, but educators must be convinced of it. And not only the educators but the public in general, and parents in particular, must be given the opportunity to appreciate this new move to the full, so that what the school tries to convey is not undone by the home. Other agencies concerned with the well-being of society have also to be influenced so that, in turn, they can lend their powerful support to the effective implementation of population education. This is already happening for example, in the field of agencies dealing with the eradication of illiteracy and the promotion of functional literacy and those promoting workers' education. However, in both these cases, the target groups are generally adults—say fifteen plus—and therefore, should come under the cover of the general programmes of information and education in family planning as such (which also has some component of population information). I would think that population education is primarily meant to cover the younger age groups—schoolgoers—and those who at the corresponding ages, have not received the benefit of schooling. By a natural extension, college-goers are also included because they are within a learning situation, though they too can come under the influence of the usual family planning education programmes.

(3) The third area of work for voluntary agencies lies in the sphere of conducting pilot programmes in schools, colleges, in teacher-training activities and among out-of-school groups. This, of course, can only be done by agencies which develop the interest, capacity and competence to undertake such difficult tasks. So far,

it has been our experience that, in the more forward-looking educational institutions, the principals and teachers welcome experimental programmes geared to the preparation of the children for adult roles. Devising suitable material for pilot programmes in population education has been one of the challenging tasks and there is a surprising amount of scope for them even in our crowded schools—crowded curriculum-wise and also crowded with small humanity vis-a-vis the teachers and facilities available.

While curriculum preparation for population education is going on and is a long drawn out process, and will take even longer to implement State-wise, educators, and the voluntary agencies helping them, can do some useful spadework, with careful thought and considered action. For instance, the Family Planning Association of India workers have developed an extra-curricular approach which seems to have a good potential. This has been done in a very small way as yet, in a handful of schools so far. This involves the utilisation of so-called "free periods" allowed for within the syllabus, or by using appropriate timings outside the formal hours of instruction. Outside visiting teachers or experts can be utilised within curriculum hours, but the initiative shown by interested and knowledgeable teachers is, of course, the best of all.

The preparation of adequate reference material and source books for the teachers and the production of audio-visual aids for classroom use, are a concomitant of experimental programmes. This is one way in which an agency like the FPAI can help educators to promote population education, as well as by acting as a clearing house on information on population education programmes in the country as well as the world.

(4) The fourth segment of activity lies in the vast and untilled field of studies and research. Competent agencies can provide invaluable help by carrying out attitudinal, cultural and other studies to help evolve the content and methodology so essential for a new and unprecedented programme dealing with human relations and humanity.

So far, I have attempted to cutline the role of agencies not formally engaged in teaching, as far as population education is concerned. There is one sector where such agencies have a crucial part to play—and that is in the out-of-school sector. Today in India there are 68 million school-going children—a fantastic school population. But what really hits one between the eyes is that another 64 million children are without schooling either because there are no

schools to go to or because their parents don't send them. In matters of family size, unemployment and so on, this sector is absolutely crucial. Their needs for every essential of life are the most pressing and, not the least, for some awareness and understanding of population trends and their interaction with individual lives.

It has often been the case that when a problem is almost intractable but demands attention, it is a voluntary agency that endeavours to undertake the task of trying to make some dent in the problem. It is the same with population education for the drop-outs and out-of-school children. At present, however, we know very little of how we can begin to undertake this colossal task and there can be no illusions as to the degree of success that can be achieved in the near future.

A completely new line of approach and of teaching techniques will have to be evolved for this task. In achieving this, trained educators can play an invaluable role and thus extend their helping hand to the out-of-school sector as well.

This is a brief run-through of the role of voluntary agencies in population education. I would end by emphasising that such agencies can play a catalytic role, but at the same time we who work in such agencies are well aware of and appreciate the fact that population education is a major and ultimate involvement for educators.

INTEGRATING POPULATION EDUCATION INTO THE EXISTING EDUCATIONAL SYSTEM IN CEYLON*

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"Population Education" is comparatively a new field of study. The Final Report of the Regional Workshop on Population and Family Education, Bangkok, gives the following definition of Population Education :—

"Population Education is an educational programme which provides for a study of the population situation in the family, community, nation and world with the purpose of developing in the students, rational and responsible attitudes and behaviour towards coping with that situation".¹

The feedback from the participants of this seminar could be partly helpful in preparing a meaningful course on Population Education for teachers as well as for students in Ceylon. The main objective of a Population Education course for any educational system would be, in brief, to give students an awareness and a broad vision about the relationships between population growth and development. This could be attempted at the family level (micro) and at national or even international level (macro). The first step in working out a scheme would be to develop an awareness and an insight in both the teachers and the students at their level. There are several ways of developing this insight :—e.g. new curriculum content, new orientation of traditional content. The expected meaningful understanding has to provide both the teacher and the student with a cognitive and attitudinal basis to make correct decisions. When the time for such decisions arises one should achieve the competency to

* Paper distributed at the National Seminar on Population Awareness Education, Colombo, Ceylon—March 24-27, 1972.

1 Regional Workshop on Population and Family Education, Bangkok. Draft Final Report. UNESCO Regional Office for Education in Asia, Bangkok, 1970. p. 1.

make such decisions both as an individual and as a member of society. In any case the vital question is the integration of this concept into the existing system of education.

My first submission is to consider the introduction of this new concept into the teacher education curriculum. Teacher educators have to be exposed to the relevant materials and an attempt has to be made to get them interested in this new field so that they would appreciate its importance to society. What is envisaged is to create an initiative in them to draft teaching specifications for trial use with school children.

I quote Dr. Edlefsen with the aim of emphasizing that Population Education and Family Planning or Sex Education should not be confused. "This needed 'population education' is not to be concerned with 'family planning' and 'sex education', except where age and maturity would make these appropriate".² The teacher colleges especially in Ceylon may seek the assistance of local family planning clinics since the married women trainees in our colleges cannot afford to become pregnant during their course of training. According to 'age and maturity' the introduction of the concept of sex education would be appropriate. Population Education includes much more than family planning and sex education and at certain age levels it is the *relevant content* of population education that has to be introduced to school children.

Suggestions as to where the Integration of this concept should come into Teacher Education Curriculum.

Presently the teacher education programme in Non Specialist Teachers' Colleges has the following subject areas :—

Education—I

Education—II

Mother Tongue

Environmental Studies and Social Studies

Physical and Health Education

Mathematics, General Science, Home Science/Agriculture, Religion and so forth

² Edlefsen, John, "An Urgent Need for Population Education at School level". A National Seminar on Population Education. National Council of Educational Research and Training, New Delhi, 1969, p. 24.

In general if a majority of the home educators are conversant with this new field of study they could make an attempt to integrate relevant sections of Population Education into their subject areas. For example, in educational psychology any unit can be developed to bring about an understanding of very important concepts of population education. The psychological needs of children would be one such instance. When a second child is born to a family within a short space of about one to two years an unavoidable situation of the elder child feeling neglected and rejected arises.

The younger sibling invariably becomes the centre of attraction of the family. "The need for longer intervals between the births of children and hence the advantages of small families", could be an interesting topic for discussion. The psychological needs such as security, new experience, recognition and responsibility could be easily catered for with the small families. The topic on Intelligence can be correlated to show the advantages of small families. A unit on environmental stimulation for the development of personality can be advantageously incorporated into most of the aspects of population education.

Under "Child Development and Behaviour", one could co-ordinate several units of population education with parental love and care, environmental facilities, etc.

As indicated above each lecturer can work out specifications for integrating population education units in his subject area. Of course the teacher educator has to achieve the requisite competency to do this intelligently and meaningfully. Some of the topics on Population Education as listed by Chauls³, are given below.

Advantages and disadvantages of small and large families (as perceived by the individual) to himself (as future parent), to his present and future families, and to his immediate community.

An introduction to demography : population distribution, birth and death rate....

The history of population growth worldwide, death control.

³ "Definition and Contents of Population Education" from Chauls, Donald S., An Introduction to Population Education in the Asian Region, Bangkok, 1970, Chapter III.

Differences between the population situations and problems in developed vs. developing countries.

Effects of rapid population growth on economic and other aspects of development, on standards of living.

Relationship between fertility behaviour and physical, mental health of parents, children.

Effects of rapid population growth on the physical and human environment.

The physiology of human reproduction.

With the above list as a guide to the content of population education, all teacher educators may make a joint attempt to select whatever topics that could easily be coordinated with their special subject.

Regarding the criteria for the selection of the topics, I quote the following section by Chauls, "In attempting to establish, or to expand, a population education programme, it is essential to be continually reminded of the fact that (in structural terms) we are just adding a topic, or a series of topics, to an existing curriculum. The theoretical justification for doing so is the assumption—and it is only an assumption—that the inclusion of a particular topic at a particular subject and grade level will enhance the possibility of eventually lowering the birth rates. To verify this assumption, it will be necessary to first teach some of these topics and then conduct longitudinal studies using psychomotor as well as knowledge and attitudinal measures.

It is a reasonable hypothesis that each topic is not of equal value towards achieving the major objectives of population education; some, in fact, may have little, if any, relevance. At present, there is no *empirical* evidence to justify the superiority of any particular topic or topics. We must rely on indirect evidence—including the opinions of educators who know their cultures to suggest which topics to introduce first, or which topics to stress most".⁴

Another very opportune place to integrate this subject is the social studies programme of the teacher education curriculum. This suggestion is to find out the possibilities of including the topic under consideration only into the environmental and social studies subjects without seeking any type of coordination with the other subjects.

⁴ Chauls, *op. cit.*

I will reproduce here a teaching unit in social studies for Grade II (8 years)⁵ for critical analysis and also to give a general idea of how to work out a rational and appropriate unit. (See appendix I).

We will have to assess the material reproduced above in the light of our understanding of the objectives and content of Population Education. It is suggested that we formulate a programme (based on it) which could be acceptable to our country. The most important criticism that could be levelled against the unit quoted above, is that most of the content might be creating in children feelings of disaffection and hostility towards their parents and siblings. Teachers introducing population education at the primary school level have to be cautioned of this danger.

Yet a further suggestion is the inclusion of a simple unified course on Population Education into the Teacher Education curriculum. Something equivalent to the course suggested by the Bangkok Workshop can be tried out. A copy of this course is given in appendix II.

My second submission is to consider the introduction of this new field to the primary school and on a more developed scale to the secondary school.

We all know that our primary school curriculum is to a great extent flexible and hence relevant concepts of population related material can meaningfully introduced in subject areas such as environmental studies, (local history, geography, health, nature studies, etc.) language and mathematics. In any case when one considers the limited level of maturity and experience the primary school child has, the development of relevant materials is no easy task if the objectives are to be achieved. Professor J.E. Jayasuriya, lucidly explains the case when he says, "The development of materials at a relatively simple level of intellectual sophistication is no easy task, and there is a certain danger that the concepts in population education that are to be introduced may undergo a considerable over-simplification in the process.... If our objective in introducing population education at the elementary or primary school level is limited to making children conversant with simple population data and with population growth as an issue that touches human life and society at a number of points, it should be possible to give such an awareness without

5 Population Education Teaching Units—Science, Social Studies, Health, Home Economics of the Bureau of Public Schools, Manila, Philippines, (May 11—June 1970).

necessarily claiming a successful inculcation of the small family norm and decision making many years later in accordance with it".

Middle and late adolescents are normally in the secondary and tertiary level institutions. Their reproductive behaviour to come could be influenced by exposing them to a population education programme with marked emphasis on the small family norm. Unlike the primary school children the secondary school pupils are more mature and have a broader experience. Curriculum materials are comparatively easier to be prepared for the secondary school than for the primary. Opportunities can be provided for population education materials in a large number of subjects of the secondary curriculum. Additional subjects such as biology and economics could be very profitably utilized in ensuring the cognitive development of the pupils.

There is a possibility of having an integrated short course on population education for the last year of the secondary school. Within about 36 periods for the year, this unified course can "consolidate and integrate the knowledge and insights the pupils have gained into the problems of population growth through their exposure to population related materials in the subjects they have studied during the previous five or six years".⁶ There is a very strong case for a course of this type when one really understands the problem of population explosion and the resulting calamities in our society. Certainly an independent status to this field of study is a must.

In the foregoing analysis I have attempted to show that this is a very controversial topic and I have only attempted to give certain suggestions. What we have to do is to try out some or all of these suggestions and see whether a successful programme can be prescribed. The present is only suggestive and not prescriptive.

6 Population Education and the School curriculum. Lecture delivered by Professor J.E. Jayasuriya of the A.I.T.E., Quezon City on May 10, 1971 at a workshop on Population Education at the Zamora Elementary School, Manila.

APPENDIX I

Population Education Teaching Units—Science, Social Studies, Health, Home Economics.

Bureau of Public Schools, Manila, Philippines, May 11—June 19, 1970.

A Teaching Unit in Social Studies for Grade II (8 years).

Title : *Population Explosion and Our Crowded Schools.*

I. Objectives

A. General

Understand the nature and magnitude of the burden imposed in our schools by the rapid growth of population.

B. Specific—

1. Understand the effect of crowded schools.
2. Realize the necessity of school playgrounds and play apparatus.
3. Understand the needs of more school facilities and school supplies.
4. Know the causes of over crowdedness of schools.

II. Suggested Outline of Concepts

A. Overcrowded school with too few teachers results in ineffective teaching.

1. Substandard classrooms with 100 children squeezed in together.
2. Only one teacher for so many pupils.
3. There are not enough seats and desks, some may sit on the floor, aisles or even window sills.
4. Poor ventilation.

B. Lack of playground and play apparatus

1. Many children cannot have the chance to play because playground is too small for so many children.
2. Children often quarrel over play equipment because there is not enough for everyone.

3. Children lack exercise and recreation needed for building them physically, mentally, emotionally, socially and spiritually healthy.

C. Lack of school supplies and school facilities

1. Few books and reading materials, only but few could have the chance to have the complete materials.
2. School facilities not enough for a crowded school, canteens, toilets, libraries, clinics and drinking fountains always jammed with several long lines of children waiting for their turn.
3. Inadequate medical and dental service due to lack of personnel and clinics to meet the needs of a big enrolment.

D. Causes of overcrowdedness of schools

1. Yearly increase of enrolment, more children are born each year, no doubt that there are more enrolment every year.
2. No new buildings added. Some old buildings for an increasing enrolment. The government cannot cope with all the needs of an increasing population.

III A. Suggested Activities

1. Initiating the unit (crowded schools) (a) Structuring the room for the unit, (b) Display of charts, pictures, graphs to arouse the interest of pupils, (c) Telling stories, singing songs or reciting poems about the unit, (d) Looking around the room and other classes to see actually the crowded rooms, (e) Observing children during recess time.
2. Raising of problems (a) Raising questions about the unit. By the aid of pictures and other materials which will depict in the unit the pupils will be guided to raise their problems. Possible questions (I) How many pupils are there in our room ? Other rooms ? (II) How many teachers are there in our school ? (III) Are there enough seats for all pupils ? (IV) Is the room properly ventilated ? (V) Is the play ground enough for the children to play ? (VI) Are there play equipment in school ? (VII) Is there a library in our school ? (VIII) Are there plenty of materials for learning ? (IX) Are there medical and dental personnel in the

school ? (X) Why is enrolment in our school increasing yearly ? (XI) Why does the high rate of population growth affect our school ? (XII) What can be also done to decrease the yearly enrolment ?

B. Developmental Activities

Main Ideas—Learning activities

- (A) 1. Counting the number of brothers and sisters each pupil has at home and in school.
2. Counting the number of pupils and teachers in school.
3. Talking about the discomforts in the room.
- (B) 1. Observing children while in the playground.
2. Talking about the play equipment if ever there are. Reporting on how many times did each pupil have the chance to use play apparatuses.
- (C) 1. Finding out how many pupils have books and how many have none.
2. Talking about the school facilities and behaviour of children in the use of those facilities.
3. Talking about medical and dental services in school. Making and reciting rhymes about children's health. Going around to see the school facilities.
- (D) 1. Talking about the yearly increase of enrolment, listing down the last year's enrolment to see the difference. Making graphs on yearly enrolments. Telling how many babies are born each year.
2. Understand that the government cannot cope with all the needs of an increasing population.
- (E) 1. *Main Idea*
Remedial measures to solve crowdedness of schools.
 - 1. Late marriages make a small family.
 - 2. Limiting the number of children according to the income of the family and considering also the health of the mother.
 - 3. Child spacing results in small family size.

Learning activities

Making a survey in the community to find out the number of couples who married early. Telling advantages of marrying

late and the disadvantages of marrying early. Having a field trip to the neighbourhood to find out that sizes of families vary appreciating a small family with all conveniences. Appreciating a spacious comfortable school.

C. Construction Activities

1. Collecting pictures depicting the main ideas in the unit.
2. Drawings of instances happening in the canteen, play-ground, toilet, clinic, etc.
3. Listing names and ages of brothers and sisters.
4. Counting and listing number of pupils in all grades.

D. Culminating Activities

1. Class programmes of dialogues, poems, dramatisations and songs to summarise the outcomes of the unit.
2. Film show if available on population growth.
3. Inviting parents to the programme to share information and stories about the unit.
4. Inviting a resource person to discuss on the population explosion.

E. Evaluating Activities

1. Visiting homes of pupils to find out the number of children each family has.
2. Going to other schools to find out their enrolment.
3. Giving simple tests on concepts taken up.

IV. Expected outcomes

1. Understanding new words not in the unit.
2. Interpreting graphs accurately.
3. Reading charts and reciting poems about the unit.
4. Counting and comparing sizes of families ties among children.
5. Appreciating conducive environment for the development of good health and good learning.
6. Interpreting events based on observation at home and in school.
7. Providing experiences which will help an individual adjust to varying environmental changes around him.

APPENDIX II

Social Sciences. Course suggested by the Bangkok Workshop—*Upper Secondary Level*

I. DEMOGRAPHIC CONCEPTS IN POPULATION GROWTH

1. Description of human population

a. *Human population*

Concepts of human population

Distribution by age and sex

Geographical distribution—the density in urban and rural areas

Distribution by marital status

Occupational distribution

Distribution by literacy

Ethnic—linguistic distribution

Dependency ratio

Overpopulation

b. *Determinants of population dynamics*

Birth (natality rates; general fertility; actual fertility; specific fertility by age; fecundability; fertility behaviour; gross and net reproduction rates)

Death (mortality rate; general and specific mortality rates; infant mortality; mean length of life (life expectancy); morbidity, causes of death)

Migration (immigration; emigration; in-migration, out-migration; rural exodus; urbanization)

c. *Concepts of population growth*

Absolute rate (birth + immigration) + (death + emigration)

Natural rate birth minus death divided by mid-year population

$$\left(\frac{B - D}{P} = nr \right)$$

d. Demographic transition

Measurements of demographic transition

(Wertheim test; 40-50 per thousand—birth rate of developing countries; 15—25 per thousand—birth rate of developed countries)

Stages of demographic transition (primitive levels, high birth rate and high death rate; developing countries=high birth rate and low death rate; developed countries=low birth rate and low death rate)

II. POPULATION GROWTH*1. Trends in population growth**a. History of population growth in own country**b. Data gathering on population*

Population censuses and surveys

Civil registration (birth; death; marriage; divorces; migration; school enrolment)

Results of censuses and surveys

Departmental statistics

c. Present trends of population growth

High and constant birth rate

Gradual lowering death rate

Implications of population change during transition period in developed and developing countries

Stability in population growth

d. Future trends (possibilities) of population growth

Increase in birth rate

Decline in birth rate

Constancy in birth rate

Decline in death rate

Rapid population growth

Slow population growth

No population growth

Decrease in population

2. Causes of population explosion**a. Pro-natality factors**

- Desire for large families for economic security, social prestige and power
- Religious influence
- Social norms
- Polygamy
- Inadequate housing
- Privacy in nuclear family
- Security of joint family
- Social pressure for girls to marry
- Psychological urge for married women to have children
- Sex preference and equilibrium (desire to have sons or daughters or both)
- Need for more hands for handicraft and agricultural activities
- Production of more children for providing against expected loss
- Production of more children to prove greater masculine virility/fertility
- Little freedom for wives to decide the number of children
- Legal and religious recognition of the status of male child, for purposes of inheritance and family name
- Inducements for having more children, child allowances, tax exemption, maternity facilities, ration, etc.
- Lower legal age for first marriage
- Regional/state/racial/ethnic competition for political power
- High proportion of the population in reproductive age
- More manpower for defence needs
- Belief in the ability of agricultural technology and sciences being able to support larger populations
- Remarriage of widows/divorced women
- Short period of breast feeding.

b. Anti-mortality factors

- Health (Better maternal and medical care and better child care; increased health facilities; improved sanitation; better diet; greater control of diseases; provision of recreational facilities; benefit of maternity leave with full pay; improved water supplies)

Education (Increased in-and out-of-school educational facilities; higher educational attainment; health education programme)

General (Improved social welfare services; better housing; adequate clothing; improved technology leading to more effective control of natural environments and catastrophies; arguments against population control)

3. Consequences of rapid population growth for economic/social development

a. Economic development

Land (smaller land-holdings; scattered land-holdings; uneconomical land-holdings; decrease in cultivated land due to greater demand for buildings; loss of natural fertility of land; greater consumption of limited natural resources; land-holdings unsuitable for the use of modern technology; low quality and quantity of the yield because of saturation point of intensive cultivation)

Capital (decline in per capita income; neutralization of effort to raise per capita income; less saving; slow formation of capital for further investments; concentration of capital in fewer hands; low tax paying ability of the people; greater consumption of government capital for providing social services)

Labour (increase in unemployment/under employment due to increase of the people in the working age; increase in unskilled labour; increase in dependency ratio; increase in child labour (because of being cheaper and to supplement family income); lesser employment opportunities for women; lower efficiency quality of work; lower wages/cheap labour; reduction in the dignity of man/labour; increased competition for jobs; increase in frustration because of increase competition; race for higher competencies, qualification because of increased competition; less jobs with better prospects for people of lower socio-economic strata; possibility of mob-violence by labour force and unemployed people)

Industry (proportionately—lesser facilities for teaching modern technology; greater dependence on foreign investment in industrialization; need for industrial development for providing jobs to growing population.)

b. Social development

General effects of population growth on social development (shortage of medical; educational; recreational; civic; transportational; communicational facilities; difficulties of financing various kinds of facilities.

Health (poor sanitary conditions; greater possibilities of spread of infectious diseases; lower vitality because of inadequate nutrition; lesser immunity to diseases; greater mortality rate; mental retardation; emotional upsets; nervous breakdowns; ill-health of workers)

Education (lower quality of education; higher teacher pupil ratio; remote chances of achieving universal literacy; over-crowding in classrooms)

Transportation (overcrowding in buses/trains, increase in road, traffic hazards; low ability to own transportational/communicational facilities).

Social relationships (increase in inter-regional; inter-tribal; inter-sectarian prejudices and clashes of interests; deterioration in landlord tenant and labour-management relationships; increase in strike and riots; juvenile delinquency; social maladjustments; sibling jealousy)

4. Measures to check rapid growth of population**a. Individual measures**

Late marriage

Self control

Use of contraceptives

Longer breast-feeding period

b. National measures

Family planning programme

Provision of clinical facilities

Population education programme in schools

Raise in the legal age of marriage

Withdrawal of certain government facilities to a family beyond a particular size

Rewards for family planner/promoters of family planning

c. International measures

International organisations interested in Population Control
Financial aid for national programmes of population control
Consultant services for planning national programmes of population control

Facilities for training personnel for population control

Dissemination of information about population control in different countries.

POPULATION EDUCATION*

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The birth of a baby is a blessed event. But a count of these multiple blessings on a family and national scale gives rise to a large question mark as to what extent a country in the throes of modernization is capable of coping with them. It is possible to be overwhelmed by blessing, which in the context of the population situation, is exactly what is taking place in the developing world today. The purpose of family planning programmes is to regulate this flow of blessings, by dealing with the immediate problems of large families which are characteristic of a rapidly growing population.

While these programmes have achieved a certain degree of success, it is becoming increasingly evident that the additional input, by way of effort and funds, needed to maintain, if not to improve the existing situation, presents the oft quoted Alice in Wonderland phenomenon of having to run very fast in order to stay in the same place. So it is that family planners, within the last decade, have researched into more realistic motivational efforts, and, as a result, have joined forces with educators in formulating the concept of population education.

Clinically oriented family planning programmes are primarily short term measures designed to bring about immediate results. Population education goes a step further. It takes into account the long term relationship of man's attitudes and behaviour in determining the population situation through individual demographic decisions. The small family norm is the ultimate goal of both programmes. But, while family planning stresses the health angle, population education will hopefully prove to be a bridge, constructed with timely foresight, over which the younger generation will pass, in order to negotiate the cultural gap between social traditions and technological progress.

* Paper distributed at the National Seminar on Population Awareness Education Colombo, Ceylon-March 24-27, 1972. This was prepared for publication in the 1970 Annual Report of The Family Planning Association of Ceylon.

Working hand in hand, family planning and population education can yet avert the catastrophes related to the population explosion in developing countries such as Ceylon where the population of 12.8 million will, at its present rate of growth, double in 29 years. Low mortality and relatively high fertility (32 per 1000) has resulted in an annual population growth rate of 2.4. These rates are allied to significant factors such as a young age structure, high dependency ratio, and a relatively large number of women in the reproductive age group.

These demographic facts and figures are of not much interest to a couple on the threshold of marriage, or to a mother of half a dozen children. They can however give rise to a dramatic series of questions and answers when placed before young inquiring minds. This is precisely what population education is all about. There is not as yet a universally recognized definition or set of objectives laid down for population education, but the concept is rapidly becoming clear in the minds of educators. For present purposes population education might be defined as a means of informing students of the causes and consequences of changes in population characteristics, thereby developing in them an understanding and awareness of the close inter-relationship between population growth, national development, and the related consequences of individual decisions regarding reproductive behaviour.

The content of a programme of population education cuts across several disciplines, encompassing as it does, demographic data, the relationship of population growth to family life and welfare, socio-economic progress and ecological situations. The diversity of subject matter makes it possible to introduce population education as allied units into various subjects such as geography, social sciences, biology, chemistry, civics, mathematics, etc. at all levels starting with the primary school and extending into adult education. As an alternative to this pervasive approach, population education could be introduced as a separate subject, although this would involve more extensive innovations in the educational system. A third suggestion is to confine it to a teacher training programme and leave it to the teacher to introduce information on population into existing lessons.

Since the subject of population education is intimately connected with social mores and traditions, detailed curricula and text must take into account national and environmental characteristics. For example, it would be equally unsuitable, when teaching a village

child, to lay stress on the harmful effects of pollution by carbon monoxide in a traffic jam, as to draw the attention of city flat dwellers specifically, to the dangers of land fragmentation. Similarly in Western countries sex education can meaningfully be introduced, whereas in the East the socio-economic approach would be more relevant.

Other aspects of population education are universally acceptable. One such concept is the fact that the world is finite, a condition which demands that man adjust his reproductive rate to the available utilization of natural resources.

It is to the advantage of population education that many countries in the developing region are reorienting their educational systems along more scientific and functional lines. Education is the basic catalyst in the progress of modernization. People have a new role to play in countries such as Ceylon, where a rural based agricultural economy is shifting over to urbanized industrialization. Efforts towards self-sufficiency in food, and consumer goods, a better standard of living, a higher per capita income, the eternal quest for a better way of life, need not be stifled by frustrations, since demographic decisions can be taken by people today with regard to mortality and fertility. General education in health, sanitation, hygiene, and medicine ensure a declining rate of mortality. Population education can help the younger generation make rational and sensible decisions with regard to fertility, when they reach maturity.

Programmes and material for population education are in the making at international, regional, and national workshops and seminars. It requires the concerted efforts of family planning specialists, demographers, educators, statisticians, sociologists, manpower planners, family life and evaluation specialists to assure for population education its rightful place in planning for the future.

NEEDED RESEARCH IN POPULATION EDUCATION

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On the recommendation of the National Seminar on Population Education, held at Bombay in October 1969, the Ministry of Education took the decision to introduce Population Education in Schools. As a first step in implementing the decision, a separate Unit known as the Population Education Cell was created in the N.C.E.R.T. Even at an ideational level the diffusion of educational innovations, as compared to innovations in the fields such as medicine, agriculture and technology where the benefits accruing as a result of the adoption of new practice are immediately discernible, is comparatively slow, and it takes a long time for this innovation to be diffused into the activities of the existing school system.

Population Education is only a recent innovation and not much experience has been accumulated in any part of the world, and hence a number of exploratory studies and experiments need to be undertaken before this innovation is introduced in schools, and thereafter a continuous feed back from research involving the school system, educational administrators, parents, teachers and students need to be undertaken.

I. Aims of Research in Population Education

The main aims of research in Population Education can be listed as follows :

1. To identify contents of population education, and help develop curriculum models for adoption in schools.
2. To find out the effective means of integrating population concepts in the existing school curricula.
3. To identify solutions to problems related to the implementation of population education programmes in schools, colleges and teacher training institutions, and for young adults and out of school youths.

4. To evaluate periodically the effectiveness of introducing population education at the school level.

II. Areas of Research in Population Education

The areas of research in population education are varied and vast. Most of the research areas which apply to general education, hold good as well for population education. Only four important problem areas are identified and presented below. In each area specific problems are enumerated for illustration. These are meant to be only illustrative and suggestive, and not exhaustive.

1. Exploratory Studies :

These mainly include knowledge, attitude and perception studies. A successful programme of population education depends to a great extent upon the knowledge and attitude towards population problems of the primarily concerned groups, such as teachers, pupils, parents, and decision-makers at different levels of school administration. The differences in knowledge and attitude among these groups is an important aspect to be investigated in the context of the implementation of population education programme. Particularly, the attitude of parents towards their children receiving population education instruction in schools needs to be investigated. Needed studies in this area may be enumerated as follows :

1. A study of the attitude of parents and teachers (including teacher educators and educational administrators) towards the introduction of population education in schools.
2. A study of the teachers' and pupils' knowledge about population problems.
3. Studies to identify socio-cultural constraints operating against teaching of population and sex education in schools.
4. The factors influencing parents' and teachers' attitude towards population education programme.
5. The extent of instruction on population and allied subjects, now existing in schools and colleges.
6. The attitude of parents and teachers towards the introduction of sex education in schools.
7. The extent of sex education being taught at elementary and secondary levels.
8. The factors inhibiting the teaching of sex education in schools.

2. Studies Pertaining to Curriculum Development

Studies leading to the development of suitable curriculum in population education is an important area of research. The sensitive social values involved in introducing population education must be investigated and integrated into the curriculum on population education. Research in this area will answer the following type of questions. What social and cultural values are to be imparted through population education? What population concepts are to be introduced into the curricula? Whether population education can be taught as a separate school subject or be integrated with the existing school curricula? The following are some of the specific studies in this field.

1. Studies to identify the population concepts to be incorporated into the school curricula.
2. A study of the content analysis of the syllabi to find out the status of population information being already provided in different school subjects.
3. Development of different curriculum models based upon the themes or concepts and testing them in experimental and controlled situations.
4. A study of the interest patterns of pupils of different age groups towards demographic and population problems.

3. Studies pertaining to instruction

Research in this area will answer questions such as :—

How to teach population concepts in the class room? What methods of instruction would be more effective? Is it feasible and advantageous to teach population education as separate school subject? Studies in this area are mainly aimed at finding out the effectiveness of different instructional methods. The following are some of the studies related to this area.

1. The relative effectiveness of teaching population concepts as a separate course and those taught by integrating the concepts through existing school curricula.
2. Action research studies to find out the difficulties involved in the integrated approach to the teaching of population education when one teacher teaches different school subjects to the same class as in elementary schools or where different subject teachers teach a particular subject to classes as in secondary schools.

3. The effectiveness of case study approach and Problem-solving approach to the teaching of population concepts.
4. The relative effectiveness of teaching population concepts through co-curricular activities and by extension lecture method.
5. The relative effectiveness of instructional methods and media for the different target groups.

4. Studies Pertaining to Evaluation and Follow up

Evaluation is a continuous process and is essential to find out the impact of introducing population education programme on the school system. Evaluation of the impact of population education on the pupils' knowledge, attitude and values pertaining to population problems need to be studied on a continuous basis. Research in the area would answer questions such as what is the impact of teaching population education on children at different school levels? What tools and techniques are to be developed to evaluate the change in knowledge, attitude and behaviour of the pupils exposed to population education? The following studies are related to this area.

1. Studies to find out how certain personal variables such as teachers' age, experience and professional training, affect pupils learning in population education.
2. Studies to find out how certain psychological variables such as the teachers' attitude and values towards the adoption of a small size family affect pupils' knowledge, attitude and behaviour.
3. Development of tools and techniques for evaluating student achievement in population education.
4. A cost-benefit analysis to evaluate the impact of population education in terms of the expected outcomes of instruction.

Conclusion :

In conclusion, it can be said that population education is still in its infancy, and a number of exploratory studies need to be undertaken before the programme is implemented. Studies are needed at different levels of school education and separately for university stage and for out-of-school youths. Studies on the administrative and management aspects of implementing population education at different levels in schools and colleges, including cost-effectiveness analysis of alternative strategies for implementation goes a long way in providing guidelines to the educational authorities for the early implementation of the programme.

TEACHER PREPARATION FOR POPULATION EDUCATION

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Unless and until our teachers and would-be teachers are exposed to the problem of Population Education and unless a faith is created in their minds about the great intensity of the problem vis a vis the future prosperity of the country, not much success can be achieved in the proper orientation of the school-going children. As is well known the main purpose of including small doses of Population Education as an integral part of the elementary and secondary syllabi is to slowly but surely inculcate in the young minds a gradual consciousness of the patent fact that the material resources of a country can only be stretched to a certain extent, and if individual share has to remain respectable and effective and if standards of living have to remain adequate, the number of share-holders has necessarily to be restricted.

There is no denying the fact that population will always increase to some extent as a natural course, but this should not be allowed to get out of proportion. In a developing country like India, it becomes all the more important because we have yet to fully develop our resources and the present population figures are already menacingly high.

It is also a patent educational truth that the success of any educational scheme, plan or project does not depend merely on the administrators or planners at the top but it largely depends on the efforts of the individual class-teacher. And unless and until he is involved deeply in the process at all stages and levels, the urgent problem of Population Education will also remain only of ornamental value, as has been the case with so many of our other schemes and projects.

I will, therefore, like to join whole-heartedly with those who emphasise the fact that Population Education has to be included in all our teacher education programmes both for elementary and

secondary school teachers in a big way. In fact it has to be so fused with the teacher education curriculum, sessional work and co-curricular activities that the impact becomes surer and deeper, although perhaps imperceptible. It must be remembered that it is mainly a question of developing certain attitudes.

Further, besides including Population Education as an integral part of pre-service training, it is also essential to have a massive programme of in-service education for in-service teachers. Orientation of the educational administrator and supervisor is also equally important and must go on simultaneously so as to minimise any possible resistance from this category of educational workers.

Secondary Level

The B.Ed./B.T. training programme has usually three parts :

- (a) Theory Papers.
- (b) Sessional work; and
- (c) Practical Skill in Teaching.

Besides, some programme of extension lectures, seminars, workshops and other co-curricular activities is also carried out in every College of Education worth the name.

Let us now examine the possibilities of including items related to Population Education in the various parts.

1. Theory Paper

The general pattern in the country is to have five or six theory papers viz. :—

- (i) Philosophy and Sociology of Education;
- (ii) Educational Psychology;
- (iii) School Organisation;
- (iv) General Methods;
- (v & vi) Two teaching subjects.

In many Universities, there is no separate paper in General Methods. Instead there is a composite paper having three parts i.e. General Methods and two teaching subjects. In some Universities, every candidate has also to select one optional paper out of a list of many i.e. Basic Education, Guidance, Adult Education and so on.

- a. A sagacious curriculum framer could introduce some indirect references to the problem while dealing with the aims of edu-

cation and its sociological aspects in the paper on Philosophy and Sociology of Education.

b. Implications of the size of the family on the psychological development of the child could be studies in paper II.

c. In the paper on General Methods it may be pointed out that the use of mass education media is partly linked with the problem of numbers. It is idle to talk of individual attention and teacher-pupil relationship while the number of students continues rising at an alarming rate.

d. In the paper on School Organisation, it should be made clear that all attempts at providing good school buildings, equipment, text-books etc. are going to be defeated, if the numbers go on increasing fast. If population continues increasing at the present rate, it may not be possible to provide even below minimum facilities to the average Indian child and the phenomenon of free education may have to be abandoned because of lack of resources. The number of students is increasing faster than the number of trained teachers and all our efforts for abolishing single-teacher school and multiple-class teaching may not only be delayed but even defeated.

e. The best ground for the inclusion of matter regarding Population Education can, however, be found in the teaching subjects, specially in Languages, Mathematics and Social Sciences. I would like to say that matter on the subject of Population Education be included in a subtle manner and not as a fettish so that the problem of numbers vis-a-vis material resources of India comes again and again to the fore.

In the subject of Social Studies, the ground seems to be very fertile for such a fusion. Help will have to be taken from the suggested syllabi on Population Education formulated by the National Council of Educational Research and Training, and other bodies for the various levels of school education.

f. In addition it may be useful to include Population Education in the list of optional subjects, or perhaps Population Education could become half a paper in the option on Health and Physical Education. The details of courses will have to be worked out by the various Boards of Studies in the Universities.

The optional full/part paper on Population Education may deal in detail about the need for demographic studies as a means to highlighting the problem of numbers. A comparative study of conditions in some other countries could also be included. As the

trainees are usually, quite mature, I would not even mind including some information regarding the various Family Planning techniques. This will have a double advantage, first the teachers themselves will be able to follow these techniques and secondly they may be able to share the knowledge with their friends and others in a worthwhile manner without making a fettish about it.

In certain universities there is a paper entitled "Current Problems of Indian Education". Here special mention may be made of the problem in all its implications viz.

- (i) main features of Indian population alongwith population rise during the last fifty years and a comparative study with some other countries both in the developed and the developing categories.
- (ii) population, food supply, standard of living and provision of educational facilities and national health.

2. Sessional Work

Social service and community work should offer a very fertile and convenient opportunity for a deep inculcation of useful ideas, regarding Population Education. Surveys of individual families their number and the family resources may be undertaken, and I am quite sure such surveys will be an eye opener of the grave situation that exists in a normal Indian family. Comparison of a small family and a big family with similar resources may be a further point. A small family with average resources can give better education and amenities to their children than a large family even if with better resources. Such case histories with stress on educational facilities for children should be assigned to all trainees. Surveys may be conducted both in rural and urban areas as well as in varying family circumstances. If trainees involve themselves sincerely in such survey work, it will, I am sure, leave serious impact on their minds.

Visit to Family Planning clinics and hospitals in order to gain family planning information may be an added programme. After all, all trainees are mature and they stand to gain individually and inspire others.

3. Skill in Teaching

Under the practical Skill in Teaching programme where trainees have to give actual lessons in the class room, there could

be found good opportunities to deal with much relevant matter on the problem.

A certain percentage of lessons may pertain to items from Population Education, specially in languages, Mathematics and Social Studies. In the final examinations extra credit may be given to those candidates who deal with topics regarding Population Education, to provide further incentives at least in the initial stages.

4. Co-curricular Activities

Programmes on population education should fit in very well in co-curricular programmes arranged by a college of education. These programmes usually include items like declamation contests, debates, stage-plays, one-act plays, symposia etc. Items can always be found out to, in a suitable manner, highlight the urgent necessity of restricting population in order to have a better standard of individual and national growth. Trainees may be encouraged to study demographic literature as a preparation for essay writing contests and debates. Poetry competitions and plays could also suitably lead to this orientation. Extension lectures on the relevant subjects could be given by Family Planning experts and demographers and may provide useful initiation.

The problem of educated unemployment and the problem of the ever-increasing size of school and college classes are items of immediate interest to teachers and students alike and they can be directly linked with the work in any college of education.

Elementary Level

At the elementary level the programme of curricular and co-curricular work is more or less on similar lines. In some states the duration of such training is one year but in most it is two years. In a two year course some content matter is also included and as such added opportunities could be found to include suitable material on Population Education at proper places.

In most of the training courses for elementary teachers, there is a paper on Health and Physical Education besides some practical work in Art and Craft. Suitable matter relating to population education and sex education could be included under this heading. While making charts and models the trainees could select demographic and allied studies for illustration. There are other training

courses also like Language Teachers Training and Training in Physical Education. Similar action is desirable there also.

Post Graduate Level

At the post-graduate level, there can not be much scope for any formal inclusion of matter regarding population education in the theory papers for the M.A. or M.Ed. courses. Perhaps some mention could be made in the paper on Philosophy of Education. In the elective papers Curriculum Development and Educational Administration and Supervision may provide some scope for the inclusion of relevant matter. Dissertations that usually form a part of these courses could provide good opportunities for useful investigations and studies in demographical and allied studies. Some relevant areas may provide some scope for useful research work at the Ph. D. level also.

I am, however, not immediately bothered about much post-graduate work in the area of population education. My main anxiety is to expose secondary and primary school teachers to the urgency of the problem. Let us first make a beginning at that level.

Adult Education

Adult Education Programmes also provide a very fertile soil for the inculcation of useful information regarding family planning and allied programmes. Mostly trained teachers are put incharge of the Adult Education Programmes either on a whole time or on part-time basis. Suitable orientation of the Adult Education Workers/Teachers is, therefore, also necessary.

Here the work will have to have more direct bearing on the subject of Family Planning. The twin purpose is proper mental preparedness as well as practical acquaintance with the family planning programmes. Help could be taken from the Health authorities through their Family Planning personnel while training teachers for the adults.

Epilogue

I am quite sure that unless and until we spread proper consciousness amongst our teachers at all levels and enlist their co-operation, all attempts at giving Population Education to children will come to nothing. We are just starting our programmes on Population Education and we must realise its pre-requisites. It is,

therefore, suggested that due attention should be given to the problem by our teacher educators and by agencies which are responsible for framing syllabi for such courses.

Population Education must be taken up as an essential programme in our teachers training institutions both for their pre-service as well as their in-service programmes. In this matter the National Council of Educational Research and Training through their Extension Services Departments should come to our help. The State Institutes of Education and other such agencies responsible for in-service education of teachers could also suitably remodel their present programmes to include Population Education as an important item in an integrated manner.

IN-SERVICE TEACHER TRAINING PROGRAMME FOR POPULATION EDUCATION*

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The unprecedented growth of population in recent years has been rightly termed as 'population explosion'. Population explosion has adversely affected per capita income, standard of living, and further aggravated the poverty and hunger in many countries. These countries on the world map are finding difficult to balance their resources with the increase in population. India is also one of the countries in this unfortunate situation.

According to the 1971 Census, India's population was 546,955,945 as against 439,072,582 in 1961. Thus increase in total population in the decade was 107,883,363 or 108 million. The growth rates during the decade ending in 1971 was 24.57 as against 21.64 in the previous decade. United Nations experts have estimated that India's population by the turn of this century will be about 1,000 million when the world will have about 6,500 million people. In other words by 2,000 A.D. roughly every sixth man in the world will be an Indian.

The Need

India's population increase must be curbed otherwise no real improvement in the standard of living of the people is possible. The problem has to be tackled through different angles and the participation of every person is necessary. One of the important features of our country's population is the predominance of young people. About 45% are below 15 years of age. Among this section a significant part will become parents after a few years. Thus in recent years, a large number of educationists are supporting the idea that

* The author gratefully acknowledges the valuable comments given by Prof. T.S. Mehta on the first draft of this paper. However, for any shortcoming he is in no way responsible.

young children should be made aware of population problems. With this in view they feel a massive programme of 'Population Education' should be started in the schools and colleges so that students could take a right decision about the size of their future family.

This necessitates training of teachers who could impart ideas to the students in a right and scientific manner. The national seminar on Population Education held at Bombay in August 1961 recommended that "Immediate steps should be taken to organise courses on population education in the Teachers' colleges at the primary as well as the secondary levels" and "suitable steps should be taken to organise in-service training for the teachers who are already working." The All India Conference of Directors of Public Instruction held at Vigyan Bhawan, New Delhi from October 21-23, 1971 to discuss the ways and means to implement the population education programme in the schools suggested that "for in-service training of teachers an intensive programme (a national crash programme) should be immediately taken up.....Short term refresher and in-service programmes of a duration of one to two weeks be introduced both at the primary and secondary teacher training levels."

The Problem

Population education is a new area and its contents cut across many subject (disciplines) already existing in the curriculum of general education. Experts in the field are of the opinion that a separate subject for teaching population education is not needed. Since the school curriculum is already overburdened, population education contents could be taught by integrating them with the social, physical and biological science subjects. This, in other words, needs well equipped qualified teachers who could handle the subject carefully and may give population education bias in their day-to-day teaching. Such skill could be developed by organising effective short-in-service courses for population education. Short courses, in the initial stage can train enough number of teachers to take up the programme systematically. For the spread of innovations in the field of education, if they have to reach a large number of students in true sense, in-service programme is the most successful device. Another advantage is that in-service programme in population education will convince the teachers themselves to restrict their family size. Until and unless a teacher is convinced himself, he cannot demonstrate the lesson effectively and will not be in a position to deliver the goods.

Objectives

The in-service teacher education programme aims at imparting to teachers the knowledge and understanding about the population situation, to help them in developing the right attitudes towards the family size and; to equip them with necessary skills in their day-to day teaching effectively. The programme, it is further hoped, will enable the teachers to develop the proper attitudes among students so that they could also take a wise and rational decision about the family size when they become adults.

A few objectives of the in-service programme for population education are listed below :

- (1) To develop an understanding in teachers about the population situation and its implications on social and economic life of the country.
- (2) To make the teachers aware about the trends of population growth in developing and developed countries and its comparison with India.
- (3) To inculcate among teachers an understanding of the visible impact of population growth like problems of transport, overcrowding etc.
- (4) To develop an understanding about the different biological factors responsible for population growth and the relationship of population and environment.
- (5) To impart the knowledge about some of the problems which are the product of population growth e.g. social tensions, crimes etc.
- (6) To develop an understanding in teachers about the advantage of short family and its impact on the quality of life.
- (7) To develop an attitude among the teachers so that they could take wise and rational decision about the family size.
- (8) To develop in teachers the skill of locating the areas related to population education and to weave the contents of population education effectively in their teaching subjects.
- (9) To develop the ability of collecting and analysing the demographic data and interpreting the charts, graphs etc. related to population.

(10) To develop the ability of involving the community in population education programme.

Processes

The orientation of teachers can be undertaken in different ways. In the initial stage to suggest any single method would not be in the interest of overall growth of the programme. However, the major processes can be the following :—

(1) Pre-service Training

It would be appropriate if Population Education can find a place in the pre-service teacher training programme of our country. It could go as a separate subject in the syllabuses or may be infused in the existing course-content. Pupil teachers may be asked to develop a few lessons having population education bias in their main teaching subjects.

(2) Orientation Courses

Short in-service orientation courses of two to three weeks duration may be organised for the in-service teachers. The main objectives of the programme would be to acquaint them with the various facets of the population education and to train them in the art of developing lessons with population education bias. They may also be told about the various teaching aids which make the population education programme more interesting to the students.

(3) Extension Lectures

It would be in the fitness of the programme that extension lectures may be organised in the various training colleges of our country. These lectures followed by lively discussions would inculcate interest among teachers. Radio and Television may also be utilised for arousing the interest of teachers and students in population education.

(4) Instructional Material

Through relevant instructional material, a large number of teachers could be exposed to the idea of population education. These materials may be prepared by different persons who are well conversant with the field. For example hand-book, work-books and resource material form one type of instructional material. Another type could be teaching units and lessons plans. A third type could be the audio-visual materials like film strips, slides, etc. Graphic

materials like charts, flow-charts, etc. could be used to demonstrate the trends in population growth and their impact on different aspects of life.

Content

The content of in-service programme for population education may be worked out keeping two points in view :

- (a) the quantum of knowledge which is to be given and
- (b) the methodology to impart that knowledge effectively.

The first is generally drawn from the syllabus while the second, that is, methodology would flow from the nature of the content, the level of the learners and the accepted laws of learning.

Teacher is pivotal for the successful implementation of the programme. His orientation and training are important. It is, therefore, necessary that any planning of the population education programme should take into consideration this dimension and give it its due importance. Teacher training (in-service and pre-service) with this view appears to be the back-bone of the population education programme.

TABLES

TABLE-I
FIGURES AT A GLANCE

Census of India 1971—Provisional Population Totals

A. POPULATION OF INDIA	Total	546,955,945
	Males	283,055,987
	Females	263,899,958
B. DECAENNIAL POPU- LATION GROWTH RATE 1961-71	24.57 per cent	
C. DENSITY OF POPULATION	182 per Sq. Km*.	
D. SEX RATIO	932 females per 1,000 males	
E. LITERACY RATE ...	Total 29.35 per cent	
	Males 39.49 per cent	
	Females 18.47 per cent	

*Excludes NEFA and J & K for which data are not available.

Source : Census of India, 1971, Provisional Population Totals (Paper 1 of 1971), Registrar General & Census Commissioner, India, 1971.

TABLE-II

DISTRIBUTION OF POPULATION, SEX RATIO AND DENSITY OF POPULATION
BY STATE/UNION TERRITORY AND OTHER AREAS

Sl. No.	India/State/ Union Territory	Persons	Population 1971		Sex Ratio i.e. Females per 1000 Males		Density of Population per Km ²	
			Males	Females	1961	1971	1961	1971
1	2	3	4	5	6	7	8	9
	INDIA	546,955,945	283,055,987	263,899,958	941	932	138	182
	STATES							
1.	Andhra Pradesh	43,394,951	21,944,826	21,450,125	981	977	131	157
2.	Assam	14,857,314	7,813,565	7,043,79	871	901	112	149
3.	Bihar	56,387,296	28,839,524	27,547,772	994	955	268	324
4.	Gujarat	26,660,929	13,771,613	12,889,316	940	936	112	136
5.	Haryana	9,971,165	5,317,149	4,654,016	868	875	172	225
6.	Himachal Pradesh	3,424,332	1,735,106	1,689,226	938	974	51	62
7.	Jammu and Kashmir	4,615,176	2,452,661	2,162,515	878	882	—	—
8.	Kerala	21,280,397	10,538,873	10,741,524	1,022	1,019	435	548
9.	Madhya Pradesh	41,449,729	21,352,291	20,097,438	953	941	74	93
10.	Maharashtra	50,295,081	26,024,146	24,270,935	936	933	129	163
11.	Mysore	29,224,046	14,910,851	14,313,195	959	960	123	152
12.	Nagaland	515,561	275,359	240,202	933	872	122	31
13.	Orissa	21,934,827	11,028,036	10,906,791	1,001	989	123	141
14.	Punjab	13,472,972	7,192,305	6,280,667	854	873	29	268
15.	Rajasthan	25,724,142	13,442,056	12,282,086	908	914	51	75
16.	Tamil Nadu	41,103,125	20,772,549	20,330,576	992	979	259	316
17.	Uttar Pradesh	88,299,453	46,896,648	41,402,805	909	883	250	300
18.	West Bengal	44,440,095	23,488,244	20,951,851	878	892	394	507
	UNION TERRITORIES AND OTHER AREAS							
1.	*Andaman and Nicobar Islands	115,090	70,005	45,085	617	644	8	14
2.	Chandigarh	256,979	146,888	110,091	652	749	1,052	2,254
3.	Dadra and Nagar Haveli	74,165	36,949	37,216	963	1,007	117	151
4.	Delhi	4,044,338	2,244,290	1,800,048	785	802	1,792	2,723
5.	Goa, Daman and Diu	857,180	431,026	426,154	1,071	989	169	225
6.	L. M. and A. Islands	31,798	16,062	15,736	1,020	980	831	994
7.	Manipur	1,069,555	539,101	530,454	1,015	984	35	48
8.	Meghalaya	983,336	503,351	479,985	953	954	33	44
9.	N.E.F.A.	444,744	233,154	211,590	894	908	—	—
10.	Pondicherry	471,347	236,850	234,497	1,013	990	787	982
11.	Tripura	1,556,822	802,509	754,313	932	940	107	149

* Excludes Jawar and Sentinel.

Source : Census of India, 1971, op. cit.

TABLE III

STATEMENT SHOWING THE GROWTH RATE OF POPULATION
STATEWISE 1961-71 AND ITS COMPARISON WITH 1951-61
GROWTH RATE.

Sl. No.	India/State/Union Terri- tory and Other Area	%Growth rate of popu- lation		% variation of col. 3 over col. 4.
		1961-1971	1951-1961	
1	2	3	4	5
	INDIA	+24.57	+21.64	+13.59
	STATES			
1.	Andhra Pradesh	+20.60	+15.65	+31.63
2.	Assam	+33.51	+35.06	- 4.42
3.	Bihar	+21.38	+19.77	+ 8.14
4.	Gujarat	+29.21	+26.88	+ 8.67
5.	Haryana	+31.36	+33.79	- 7.19
6.	Himachal Pradesh	+21.76	+17.87	+21.77
7.	Jammu & Kashmir	+29.60	+ 9.44	+213.56
8.	Kerala	+25.89	+24.76	+ 4.56
9.	Madhya Pradesh	+28.04	+24.17	+16.01
10.	Maharashtra	+27.16	+23.60	+15.08
11.	Mysore	+23.90	+21.57	+10.80
12.	Nagaland	+39.64	+14.07	+181.73
13.	Orissa	+24.99	+19.82	+26.08
14.	Punjab	+21.00	+21.56	- 2.60
15.	Rajasthan	+27.63	+26.20	+ 5.46
16.	Tamil Nadu	+22.01	+11.85	+85.74
17.	Uttar Pradesh	+19.73	+16.66	+18.43
18.	West Bengal	+27.24	+3-.80	-16.95
	UNION TERRITORIES AND OTHER AREAS			
1.	Andaman and Nicobar Islands	+81.11	+105.19	-22.89
2.	Chandigarh	+114.36	+394.13	-70.98
3.	Dadra Nagar Haveli	+27.95	+39.56	-29.35
4.	Delhi	+52.12	+52.44	- 0.61
5.	Goa, Daman and Diu	+36.78	+ 5.14	+615.56
6.	Loccadive, Minicoy and Amindivi Islands	+31.90	+14.61	+118.34
7.	Manipur	+37.12	+35.04	+ 5.94
8.	Meghalaya	+32.02	+25.97	+25.72
9.	North-East Frontier Agency	+32.14	-	-
10.	Pondicherry	+27.71	+16.34	+66.52
11.	Tripura	+36.32	+78.71	-53.86

Source : Census of India, 1971, *op. cit.*

TABLE-IV

**STATEMENT SHOWING THE PERCENTAGE AND RANKING OF STATES,
UNION TERRITORIES OTHER AREAS IN POPULATION SIZE**

<i>Rank in 1971</i>	<i>States, Union Territories and Other Areas in order of Population size</i>	<i>Population 1971</i>	<i>Percentage to total Popula- tion of India</i>	<i>Rank in 1961</i>
1	2	3	4	5
	INDIA	546,955,945	100.00	
1.	Uttar Pradesh	88,299,453	16.14	1
2.	Bihar	56,387,296	10.31	2
3.	Maharashtra	50,295,081	9.20	3
4.	West Bengal	44,440,095	8.12	5
5.	Andhra Pradesh	43,394,951	7.93	4
6.	Madhya Pradesh	41,449,729	7.58	7
7.	Tamil Nadu	41,103,125	7.51	6
8.	Mysore	29,224,046	5.34	8
9.	Gujarat	26,660,929	4.87	9
10.	Rajasthan	25,724,142	4.70	10
11.	Orissa	21,934,827	4.01	11
12.	Kerala	21,280,397	3.89	12
13.	Assam	14,857,314	2.72	14
14.	Punjab	13,472,972	2.46	13
15.	Haryana	9,971,165	1.82	15
16.	Jammu & Kashmir	4,615,176	0.84	16
17.	Delhi	4,044,338	0.74	18
18.	Himachal Pradesh	3,424,332	0.63	17
19.	Tripura	1,556,822	0.29	19
20.	Manipur	1,069,555	0.20	20
21.	Meghalaya	983,336	0.18	21
22.	Goa, Daman and Diu	857,180	0.16	22
23.	Nagaland	515,561	0.10	23
24.	Pondicherry	471,347	0.09	24
25.	N.E.F.A.	444,744	0.08	25
26.	Chandigarh	256,979	0.05	26
27.	A. & N. Islands	115,090	0.02	27
28.	Dadra & Nagar Haveli	74,165	0.01	28
29.	L M. & A. Islands	31,798	0.01	29

Source : Census of India, 1971, op. cit.

TABLE-V

**STATEMENT SHOWING THE POPULATION GROWTH OF
INDIA FROM 1901—1971**

<i>Year</i>	<i>Population</i>	<i>Decadal growth</i>	<i>Progressive</i>
		<i>rate</i>	<i>growth rate</i> <i>over 1901</i>
1	2	3	4
INDIA			
1901	238,337,313	— —
1911	252,005,470	+5.73 +5.73
1921	251,239,492	-0.30 +5.41
1931	278,867,430	+11.00 +17.01
1941	318,539,060	+14.23 +33.66
1951	360,950,365	+13.31 +51.45
1961	439,072,582	+21.64 +84.22
1971	546,955,945	+24.57 +129.49

Source: Census of India, 1971, *op. cit.*

TABLE-VI

STATEMENT SHOWING THE STATES/UNION TERRITORIES AND OTHER AREAS ARRANGED IN THE ORDER OF LITERACY RANKING IN 1971 CENSUS AND COMPARISON WITH 1961

<i>Ranking in 1971</i>	<i>State/Union Territory/ Other Area</i>	<i>Literacy Rate in 1971</i>	<i>Literacy Rate in 1961</i>	<i>Ranking in 1961</i>	<i>% increase of literacy</i>
1	2	3	4	5	6
	INDIA	29.35	24.03		+22.14
1.	Chandigarh	61.24	51.06	2	+19.94
2.	Kerala	60.16	46.85	3	+28.41
3.	Delhi	56.65	52.75	1	+ 7.39
4.	Goa, Daman and Diu	44.53	30.75	7	+44.81
5.	Andaman and Nicobar Islands	43.48	33.63	5	+29.29
6.	Laccadive, Minicoy and Amindivi Islands	43.44	23.27	16	+86.68
7.	Pondicherry	43.36	37.43	4	+15.84
8.	Tamil Nadu	39.39	31.41	6	+25.41
9.	Maharashtra	39.06	29.82	10	+30.99
10.	Gujarat	35.70	30.45	8	+17.24
11.	Punjab	33.39	26.74	13	+24.87
12.	West Bengal	33.05	29.28	11	+12.88
13.	Manipur	32.80	30.42	9	+ 7.82
14.	Mysore	31.47	25.40	15	+23.90
15.	Himachal Pradesh	31.32	21.26	18	+47.32
16.	Tripura	30.87	20.24	20	+52.52
17.	Assam	28.74	27.47	12	+ 4.62
18.	Meghalaya	28.41	25.71	14	+10.50
19.	Nagaland	27.33	17.91	23	+52.60
20.	Haryana	26.69	19.93	21	+33.92
21.	Orissa	26.12	21.66	17	+20.59
22.	Andhra Pradesh	24.56	21.19	19	+15.90
23.	Madhya Pradesh	22.03	17.13	25	+28.60
24.	Uttar Pradesh	21.64	17.65	24	+22.61
25.	Bihar	19.97	18.40	22	+ 8.53
26.	Rajasthan	18.79	15.21	26	+23.54
27.	Jammu and Kashmir	18.30	11.03	27	+65.91
28.	Dadra and Nagar Haveli	14.86	9.48	28	+56.75
29.	North-East Frontier Agency	9.34	7.13	29	+31.00

Source : Census of India, 1971, *op. cit.*

TABLE VII
1971 WORLD POPULATION DATA SHEET—POPULATION REFERENCE BUREAU, INC.
(Revised Edition) August, 1971

Region or Country	1	2	3	4	5	6	7	8	9	10
WORLD	3,706 ^a	34	14	2.0	35	—	—	37	4,933	—
Africa	3,354 ^a	47	20	2.7	26	—	—	44	530	—
Northern Africa	89	47	16	3.1	23	—	—	45	140	—
Western Africa	104	49	23	2.6	27	—	—	44	155	—
Eastern Africa	100	47	21	2.6	27	—	—	44	149	—
Middle Africa	37	46	23	2.2	32	—	—	42	52	—
Southern Africa	23	41	17	2.4	29	—	—	40	34	—
Asia	2,104 ^a	38	15	2.3	31	—	—	40	2,874	—
South-West Asia	79	44	15	2.9	24	—	—	43	121	—
Middle South Asia	783	44	16	2.7	26	—	—	43	1,137	—
Southeast Asia	295	43	15	2.8	25	—	—	44	434	—
East Asia	946	30	13	1.8	39	—	—	36	1,182	—
Northern America	229 ^a	18	9	1.2	58	—	—	30	280	—
Latin America	291 ^a	38	9	2.9	24	—	—	42	435	—
Middle America	70	43	9	3.4	21	—	—	46	112	—
Caribbean	26	34	10	2.2	32	—	—	40	36	—
Tropical South America	155	39	9	3.0	24	—	—	43	236	—
Temperate South America	40	26	9	1.8	39	—	—	33	51	—
Europe	466 ^a	18	10	0.8	88	—	—	25	515	—
Northern Europe	81	16	11	0.6	117	—	—	24	90	—
Western Europe	150	16	11	0.6	117	—	—	24	163	—
Eastern Europe	105	17	10	0.8	88	—	—	25	116	—
Southern Europe	130	19	9	0.9	78	—	—	27	146	—
USSR	245	17.0	8.1	1.0	70	—	25.7	28	286.9	—
Oceania	25	10	—	2.0	35	—	—	32	1,110	27

Population Estimates
Mid-1971 (Millions)
Annual Births per 1,000 Population
Annual Deaths per 1,000 Population
Annual Deaths per 1,000 Population
Annual Births per 1,000 Population
Annual Rate of Population Growth (per cent)
Number of Years to Double Population
Births per one year (Deaths per one year)

Per Capita Gross National Product (US\$)
Gross National Product
Population Projections to 1985 (millions)
Population under 15 years (per cent)

TABLE-VII (a)
POPULATION OF ASIA, 1971

Region or Country	1	2	3	4	5	6	7	8	9	10
ASIA										
SOUTHWEST ASIA										
Cyprus	2,104 ^a	38	15	2.3	31	—	40	2,874	—	—
Iraq	79	44	15	2.9	24	—	43	121	—	—
Israel	0.6	23	8	0.9	78	27	35	0.7	830	—
Jordan	10.0	49	15	3.4	21	—	45	16.7	260	—
Kuwait	3.0	26	7	2.4	29	23	33	4.0	1,360	—
Lebanon	2.4	48	16	3.3	21	—	46	3.9	260	—
Muscat and Oman	0.8	43	7	8.2	9	—	38	2.4	3,540	—
Saudi Arabia	0.7	42	—	11	3.1	23	—	—	4.3	560
Southern Yemen	8.0	50	23	2.8	25	—	—	1.1	250	—
Syria	1.3	—	—	2.8	25	—	—	12.2	360	—
Turkey	6.4	47	15	3.3	21	—	46	10.5	210	—
Yemen (Arab Republic)	36.5	43	16	2.7	26	155	44	52.8	310	—
MIDDLE SOUTH ASIA										
Afghanistan	5.9	50	23	2.8	25	—	43	9.1	70	—
Bhutan	783	44	16	2.7	26	—	—	1,137	—	—
Ceylon	17.4	50	26	2.5	28	—	—	25.0	80	—
India	0.9	—	—	2.2	32	—	—	1.2	60	—
Iran	12.9	32	8	2.4	29	—	41	17.7	180	—
Nepal	569.5 ^b	42	17	2.6	27	139	41	807.6	100	—
Pakistan	29.2	48	18	3.0	24	—	46	45.0	310	—
	11.5	45	23	2.2	32	—	40	15.8	80	—
	141.6	50	18	3.3	21	—	142	45	224.2	100

^a Mid-1971 (Millions)
^b Estimates
^{*} to 1985 (millions)
^{**} Per Capita Gross National Product (US\$)
[†] Gross National Product (US\$)
[‡] Population Projections to 1985 (per cent)
[§] Births (per cent)
^{||} Life expectancy at birth (years)
[¶] Mortality rate per 1,000 live births
[¤] Annual infant mortality rate per 1,000 live births
^{¤¤} Number of years to double population
^{¤¤¤} Number of years to triple population
^{¤¤¤¤} Population under 15 years (per cent)
^{¤¤¤¤¤} Population projections to 1985 (per cent)

	1	2	3	4	5	6	7	8	9	10
SOUTHEAST ASIA	295	43	15	2.8	25	—	44	434	—	—
Burma	28.4	40	17	2.3	31	—	40	39.2	70	70
Cambodia	7.3	45	16	3.5	24	127	44	11.3	120	120
Indonesia	124.9	47	19	2.9	24	125	42	183.8	100	100
Laos	3.1	42	17	2.5	28	—	—	4.4	100	100
Malaysia	11.1	37	8	2.8	25	—	44	16.4	330	330
Philippines	39.4	46	12	3.4	21	72	47	64.0	180	180
Singapore	2.2	25	5	2.4	29	—	43	3.0	700	700
Thailand	37.4	42	10	3.3	21	—	43	57.7	150	150
Vietnam (Dem. Republic of)	21.6	—	—	2.1	33	—	—	28.2	90	90
Vietnam (Republic of)	18.3	—	—	2.1	33	—	—	23.9	130	130
EAST ASIA	946	30	13	1.8	39	—	—	1,182	—	—
China (Mainland)	772.9	33	15	1.8	39	—	—	964.6	90	90
China (Taiwan)	14.3	26	5	2.3	31	19	44	19.4	270	270
Hong Kong	4.3	21	5	2.5	28	21	40	6.0	710	710
Japan	104.7	18	7	1.1	63	15	25	121.3	1,190	1,190
Korea (People's Rep. of)	14.3	39	11	2.8	25	—	—	20.7	250	250
Korea (Rep. of)	32.9	36	11	2.5	28	—	—	42	45.9	180
Mongolia	1.3	42	10	3.1	23	—	—	44	2.0	430
Ryukyu Islands	1.0	22	5	1.7	41	11	39	1.3	580	580

WORLD AND REGIONAL POPULATION (millions)

	World	North America	Europe	USSR	Africa	Latin America	Oceania	North America	Latin America	Oceania
MID 1971	3706	2104	466	245	354	229	291	291	20	20
UN Medium Estimate, 2000	6494	3777	568	330	818	333	652	652	35	35

FOOTNOTES

- * Estimates from United Nations, "Total Population Estimates for World, Regions and Countries, Each Year, 1950-1985".
- Population Division Working Paper No. 34, October 1970.

** Latest available year. Except for Northern American rates, estimates are essentially those available of January 1971 in *U.N. Population and Vital Statistics Report*. Series A, Vol. XXIII, No. 1, with adjustments as deemed necessary in view of deficiency of registration in some countries.

■ Latest available year. Derived from *UN World Population Prospects, 1965-85, As Assessed in 1968*. Population Division Working Paper No. 30, December 1969 and *U.N. Demographic Yearbook, 1967*.

□ 1968 data supplied by the International Bank for Reconstruction and Development.

- Annual rate of population growth (composed of the rate of natural increase modified by the net rate of in or out migration) is derived from the latest available published estimates by the United Nations, except where substantiated changes have occurred in birth rates, death rates or migration streams.
- Assuming no change in growth rate.
- Nonsovereign country.

- 1 Total reflects UN adjustments for discrepancies in international migration data.
- 2 Regional population totals take into account small areas not listed on the *Data Sheet*.
- 3 In these countries, the UN estimates show a variation of more than 3 percent from recent census figures. Because of uncertainty as to the completeness or accuracy of census data, the UN estimates are used.

NOTE : The completeness and accuracy of data in many developing countries are subject to deficiencies of varying degree. In some cases, the data shown are estimates prepared by the United Nations.

Source : Abridged from 1971 World Population Data Sheet, Population Reference Bureau, Inc., 1755 Massachusetts Avenue, N. W., Washington, D.C. 20036 (202) 232-2288, Aug. 1971.



A few important publications of the Population Education Cell.

1. National Seminar on Population Education.
2. Readings in Population Education.
3. Population Education in School Curricula—A Working Document.
4. Population Education—A Draft Syllabus.
5. Plug Points for Population Education in School Curricula.
6. A Bibliography on Population Education.
7. Population Education.
8. Indian Population Situation.
9. National Conference on Population Education - Problems of Implementation.
10. Population Education—Selected Readings.
11. दीनू-डाकिया (जन संख्या शिक्षा पर बाल-कथा)
12. भविष्य के सप्तने (जन संख्या शिक्षा पर बाल-कथा)